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THE MANUFACTURE AND USE OF CALIFORNIA CANNED ORANGE JUICE

by

H. J. Stover

A Preliminary Report

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THE MANUFACTURE AND USE OF CALIFORNIA CANNED ORANGE JUICE

H. J. Stover[1]

This constitutes a preliminary report upon one portion of a project relating to the manufacture and use of California canned orange juice, the objectives of which are

1. To determine the character and degree of market competition between canned orange juice and fresh oranges.

2. To determine the character and degree of market competition between canned orange juice and other canned juices, such as grapefruit, pineapple, and tomato.

3. To determine the relation, from a manufacturing standpoint, of orange-juice canning to the manufacture of other orange by-products such as orange concentrate, beverage base, orange oil, pectin, and orange pulp dairy feed.

4. To demonstrate the feasibility, or infeasibility, from an economic point of view, of marketing large quantities of California Valencia oranges in the form of canned juice.

5. To determine the relative returns which growers might expect to obtain for oranges manufactured into canned juice as compared with those marketed as fresh oranges.

The portion of the project to which this report relates might be referred to as "the factual picture of the supply side of the canned-orange-juice industry." The Consumers' Counsel division of the Agricultural Adjustment Administration will report at some later date upon "the factual picture of the demand side of the canned-orange-juice industry" and "the attitudes of consumers toward canned orange juice."

This report is based, to a considerable extent, upon the returns obtained in a survey of the manufacturers of orange by-products in California, made in February, 1936.

Orange Production

The average annual production of oranges in the United States during the five-year period, 1920-1924, amounted to 34,386,000 boxes of 70 pounds each (table 1). Of this amount, 20,123,000 boxes, or 59 per cent, were produced in California, and 13,918,000 boxes, or 40 per cent, were produced in Florida. Only 345,000 boxes -- 1 per cent of the total -- were produced in other states.

By 1930-1934, the average annual production of oranges in the United States had reached 58,898,000 boxes, indicating an increase of 71 per cent in the output

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TABLE 1

Production of Oranges in the United States, by States, 1920-1935

Crop year*	California	Florida	Texas	Arizona	Alabama	Louisiana	Mississippi	Total United States
	thousand boxes	thousand boxes †	thousand boxes †	thousand boxes	thousand boxes †	thousand boxes †	thousand boxes †	thousand boxes †
1920	22,547	12,159	--	60	105	54	32	34,957
1921	13,921	11,405	--	80	105	64	39	25,614
1922	21,286	14,010	5	81	244	77	58	35,761
1923	24,324	17,051	8	86	289	96	71	41,925
1924	18,535	14,964	15	60	3	96	--	33,673
1920-1924 average	20,123	13,918	6	73	149	77	40	34,386
1925	24,200	13,299	13	86	167	129	35	37,929
1926	28,167	14,801	53	75	96	193	54	43,439
1927	22,737	12,771	90	54	141	257	64	36,114
1928	38,994	19,435	148	99	109	283	39	59,107
1929	21,483	13,248	336	137	273	240	48	35,765
1930	35,470	24,700	321	139	4	251	3	60,888
1931	34,900	18,283	669	145	103	315	69	54,484
1932	34,265	20,828	405	147	154	310	103	56,212
1933	28,439	23,271	501	143	4	273	3	52,634
1934	46,086	22,628	720	170	180	377	113	70,274
1930-1934 average	35,832	21,942	523	149	89	305	58	58,898
1935 ǂ	34,392	20,571	806	260	3	314	1	56,347

* Year beginning November 1 in California and Arizona, and September 1 in other states.

† The net contents of boxes vary. In California and Arizona the approximate average for oranges is 70 pounds net; in Florida and other states it is 90 pounds. In order that the data might be comparable, the author converted the figures for Florida, Texas, Alabama, Louisiana, and Mississippi to a 70-pound box-equivalent basis by multiplying the figures as given by the Division of Crop and Livestock Estimates by 9/7.

ǂ Preliminary estimate of indicated production.

Sources of data: Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, United States Department of Agriculture.

1920-1933: U. S. Dept. Agr. Bur. Agr. Econ. Statistics relating to the citrus industry, 1934:3. March, 1935. (Mimeo.)

1934-1935: U. S. Dept. Agr. Crops and Markets. February, 1936. p. 52.

during the intervening decade. The production increase, by states, was 78 per cent in California, 58 per cent in Florida, and 226 per cent in other states.

The annual production of oranges in the United States during the past sixteen years has fluctuated between the 1921 figure of 25,614,000 boxes and the 1934 figure of 70,274,000 boxes (table 1 and figure 1). The trend of this production has been upward at the rate of approximately 2,000,000 boxes per year.

Concerning the outlook for orange production, the United States Department of Agriculture reports as follows:2/

> "Orange-tree numbers in California, Florida, Texas, and Arizona climbed from about 20,000,000 in 1920 to around 31,000,000 in 1930, and in 1935 reached 32,000,000. Of the total trees now in groves, about 13 per cent are not of bearing age, while 27,897,000, or 87 per cent, will be in bearing for the 1935-36 crop. Of the bearing trees now in groves, about 26 per cent are from 4 to 10 years old, 18 per cent are from 11 to 15 years old and therefore approaching full production, and 56 per cent are more than 15 years old. With so large a proportion of the bearing trees still in that group where large increase in production per tree will take place, it seems inevitable that, barring unusual loss from abandonment or weather hazards, producing surface will increase materially during the next 5 years."

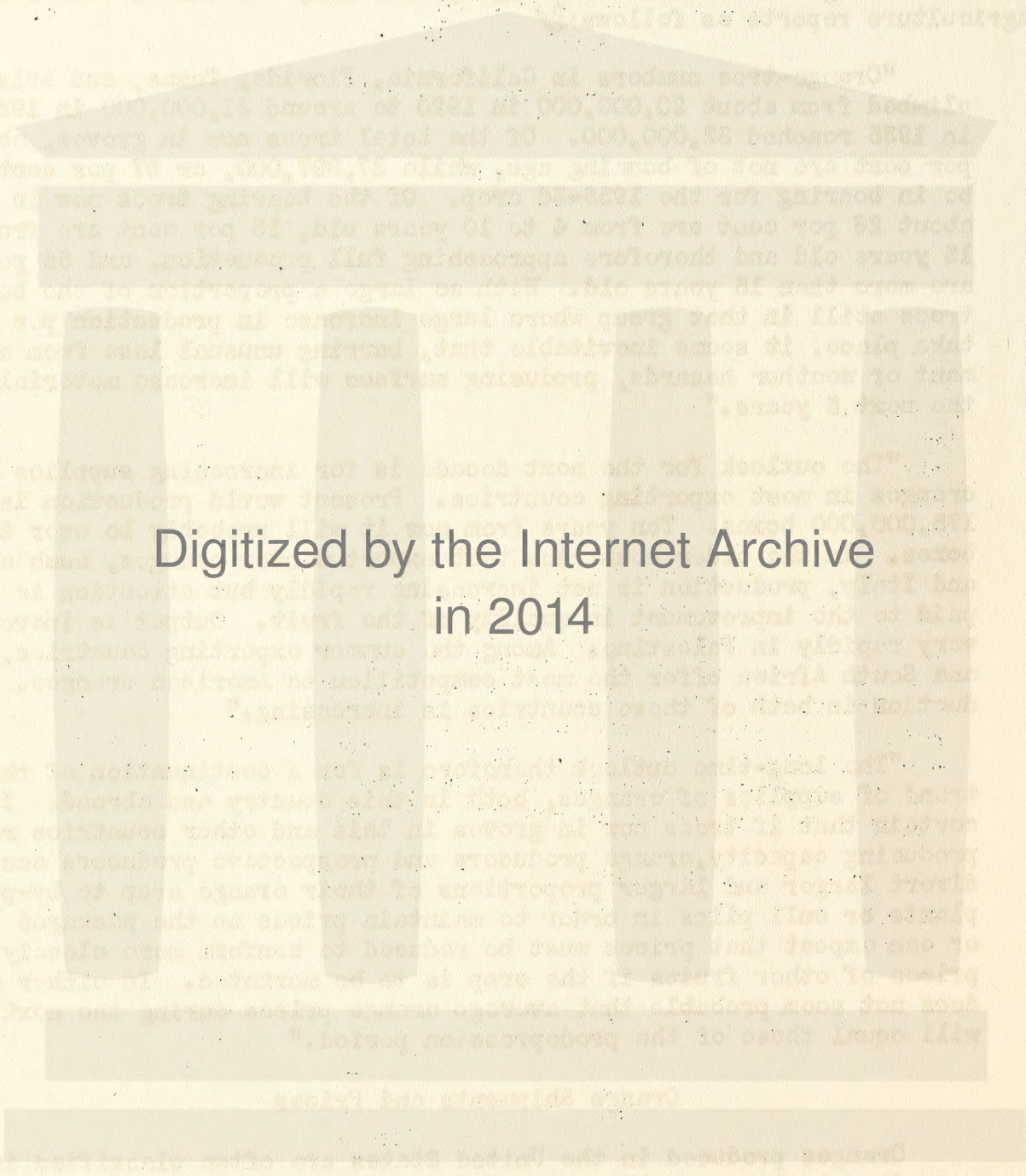
> "The outlook for the next decade is for increasing supplies of oranges in most exporting countries. Present world production is roughly 175,000,000 boxes. Ten years from now it will probably be over 200,000,000 boxes. In the older countries that export winter oranges, such as Spain and Italy, production is not increasing rapidly but attention is being paid to the improvement in quality of the fruit. Output is increasing very rapidly in Palestine. Among the summer exporting countries, Brazil and South Africa offer the most competition to American oranges. Production in both of these countries is increasing."

> "The long-time outlook therefore is for a continuation of the upward trend of supplies of oranges, both in this country and abroad. It seems certain that if trees now in groves in this and other countries reach full producing capacity,orange producers and prospective producers can expect to divert larger and larger proportions of their orange crop to by-product plants or cull piles in order to maintain prices on the packaged fruit, or can expect that prices must be reduced to conform more closely to the prices of other fruits if the crop is to be marketed. In either case, it does not seem probable that average orange prices during the next decade will equal those of the predepression period."

Orange Shipments and Prices

Oranges produced in the United States are often classified into two groups according to time of shipment. Those shipped during the six months, May through October, are referred to as "summer oranges." A large portion of these oranges is produced in California and consists mainly of the Valencia variety.

2/U. S. Dept. Agr. Bur. Agr. Econ. The Agricultural Outlook for 1936. U. S. Dept. Agr. Misc. Pub. No. 235:110-111. November, 1935.



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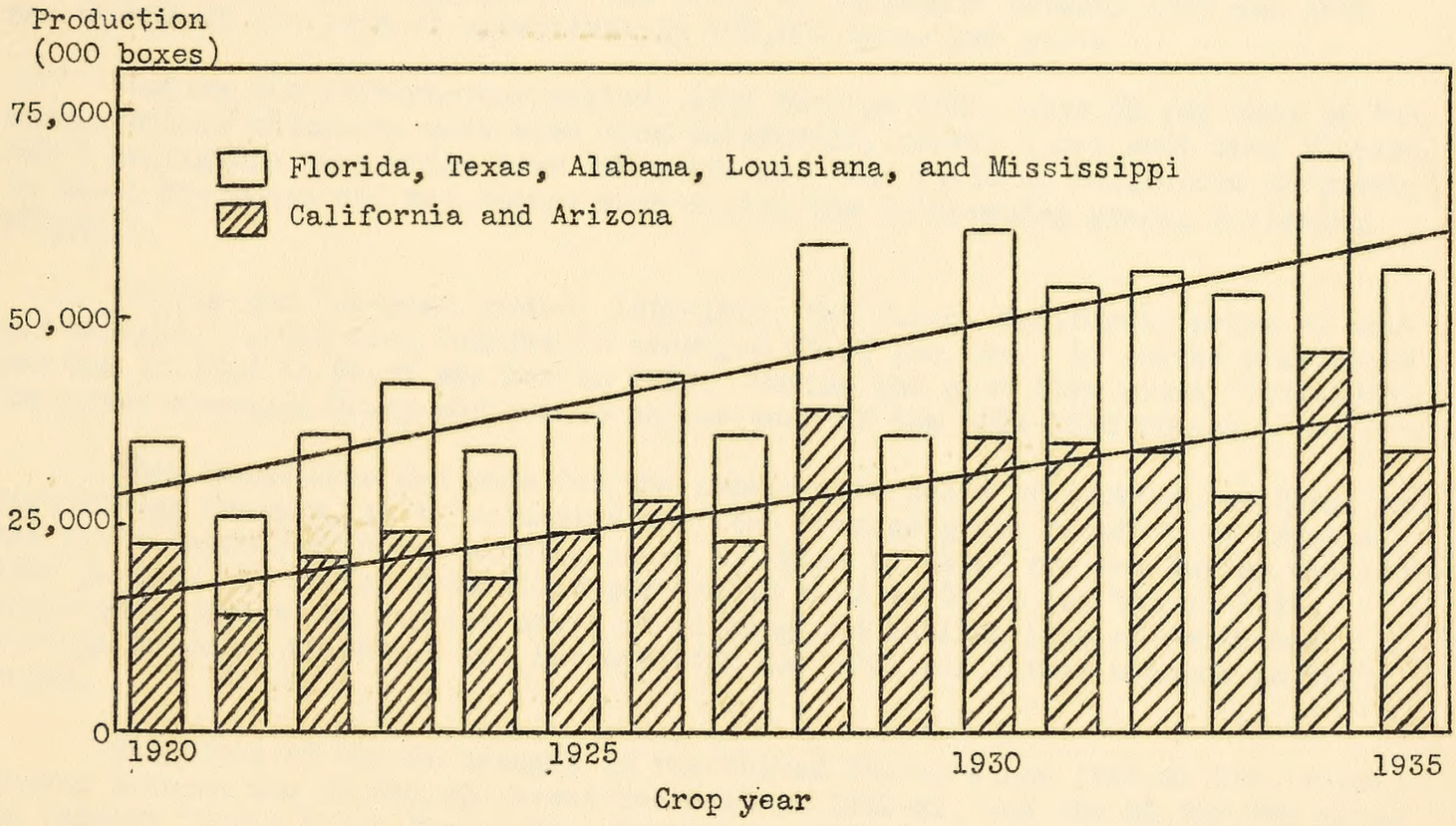
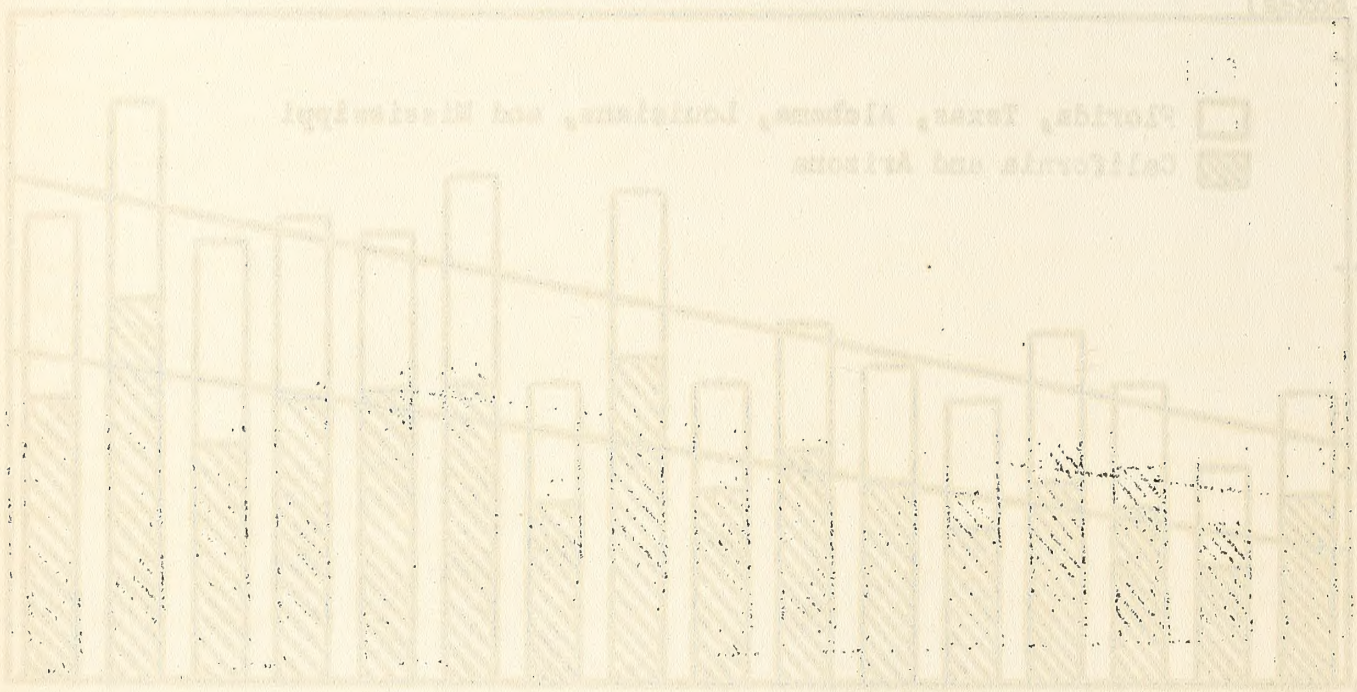


Fig. 1.-- Production of oranges in the United States, 1920-1935.

The trend of orange production in the United States since 1920 has been upward at the rate of approximately 2,000,000 boxes per year; the trend in California has been upward at the rate of approximately 1,500,000 boxes per year. (Data from table 1.)



Oranges shipped during the six months, November through April, are termed "winter oranges." They consist mainly of the Washington Navel variety produced in California and of the numerous varieties of a quite different type produced in Florida.

Shipments of summer oranges in the United States since 1921 have fluctuated between the 5,202,000 boxes recorded in 1922 and the 20,939,000 boxes estimated for 1935 (table 2 and figure 2). The trend of shipments between 1921 and 1935 was upward at the rate of approximately 800,000 boxes per year.

During the fifteen-year period, 1921 through 1935, over 91 per cent of the summer orange shipments were made from California, nearly 9 per cent from Florida, and a negligible proportion from other states. The ratio of California shipments to total shipments did not change much during the intervening years, declining slightly.

During the ten-year period, 1921-1930, the f.o.b. California price of summer oranges shipped from California averaged $4.11 per box. It varied from $2.69 per box in 1929 to $5.87 per box in 1930. During the next five years, 1931-1935, the price averaged $2.12 per box -- 52 per cent of the 1921-1930 figure.

When deductions are made for the approximate costs of packing, selling, and advertising oranges, it is estimated that the average price received by growers for fruit delivered to the packing house amounted to $1.48 per box during the 1932-1935 period. It varied from $1.17 per box in 1932 to $2.14 per box in 1934. Additional deductions for the costs of picking and hauling give an estimated average price of $1.35 per box between 1932 and 1935 for summer oranges on the trees.

Shipments of winter oranges in the United States since 1920-21 have fluctuated between the 13,850,000 boxes recorded in 1921-22, and the 30,639,000 boxes in 1934-35 (table 3 and figure 3). During the fifteen-year period, 1920-21 through 1934-35, average annual shipments have amounted to 22,812,000 boxes. The trend during this decade and one-half has been upward at the rate of approximately 900,000 boxes per year.

On the average, during the fifteen years 1920-21 through 1934-35, 55 per cent of the winter orange shipments were made from California, 44 per cent from Florida, and 1 per cent from other states. As was the case with summer oranges, the ratio of California shipments to total shipments exhibited practically no trend.

During the ten-year period, 1920-21 through 1929-30, the average f.o.b. California price of winter oranges shipped from California amounted to $3.34 per box. This figure is comparable with the $4.11 per box received for summer oranges. The fluctuation in the annual average price was between the $2.12 per box recorded in 1923-24 and the $4.45 per box in 1929-30. During the five years, 1930-31 through 1934-35, the average price amounted to $1.77 per box -- 53 per cent of the figure for the previous ten years.

An estimated average price of $1.07 per box was received by growers in California for winter oranges delivered to the packing house during the four years, 1931-32 through 1934-35. Deductions for the costs of picking and hauling give an estimated average price of $0.93 per box for the fruit on the trees.

TABLE 2

Shipments of Summer Oranges in the United States, by States, and Average Prices of California Summer Oranges, 1921-1935

May to October	Shipments				California prices		
	California	Florida	Other states	United States	F.o.b. price	Price at packing house*	Price on trees †
	1	2	3	4	5	6	7
	thousand boxes	thousand boxes	thousand boxes	thousand boxes	dollars per box	dollars per box	dollars per box
1921	10,549	409	10	10,968	3.32		
1922	4,528	661	13	5,202	4.64		
1923	10,063	1,019	3	11,085	2.73		
1924	10,086	1,056	1	11,143	3.12		
1925	6,669	577	10	7,256	5.26		
1926	10,813	483	1	11,297	3.59		
1927	12,160	829	40	13,029	4.11		
1928	9,154	607	8	9,769	5.74		
1929	17,735	1,702	46	19,483	2.69		
1930	9,306	792	15	10,113	5.87		
1931	16,426	1,937	10	18,373	2.27		
1932	16,011	851	8	16,870	1.82	1.17	1.02
1933	15,884	2,919	17	18,820	1.78	1.22	1.09
1934	15,234	1,856	46	17,136	2.74	2.14	2.01
1935	19,361	1,577 ǂ	1 ǂ	20,939 ǂ	2.01	1.41 ǂ	1.28 ǂ

* F.o.b. price less packing, selling, and advertising costs.

† F.o.b. price less picking, hauling, packing, selling, and advertising costs.

ǂ Preliminary.

Sources of data:

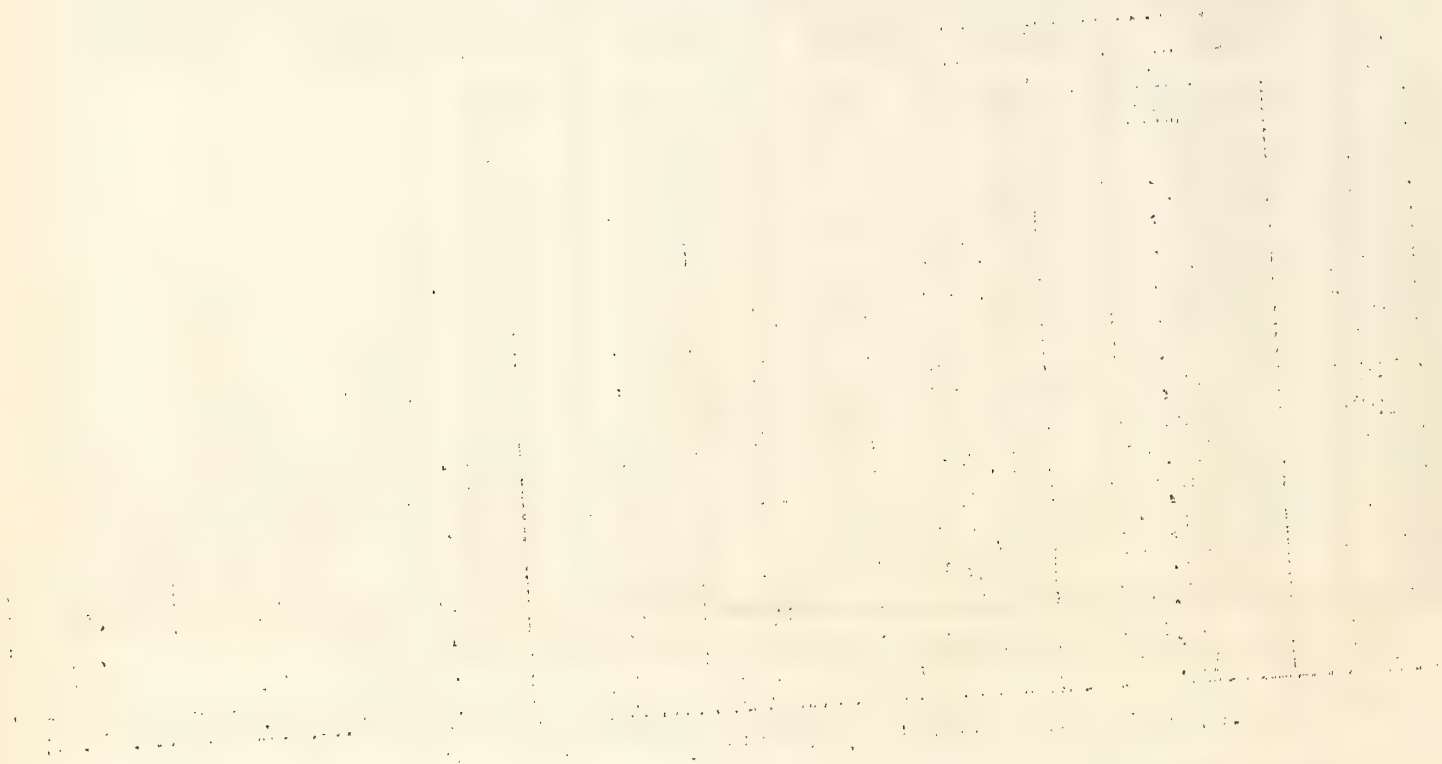
Col. 1: Compiled from records of the California Fruit Growers' Exchange.

Cols. 2 and 3: U. S. Dept. Agr. Annual summaries of carlot shipments (mimeo.) and Crops and Markets (monthly). Data converted from carlots to boxes.

Col. 4: Col. 1 plus col. 2 plus col. 3.

Col. 5: Compiled from records of the California Fruit Growers' Exchange. Prices are the weighted average prices received for oranges shipped during the six months, May through October, and include prices of packed fruit and loose fruit on a packed-box basis.

Cols. 6 and 7: Computed from cost data published in the Annual Reports of the General Manager of the California Fruit Growers' Exchange. 1932: Report for the year ended October 31, 1932. p. 29. 1933: Report for the year ended October 31, 1934, p. 27. 1934 and 1935: Report for the year ended October 31, 1935. p. 29.



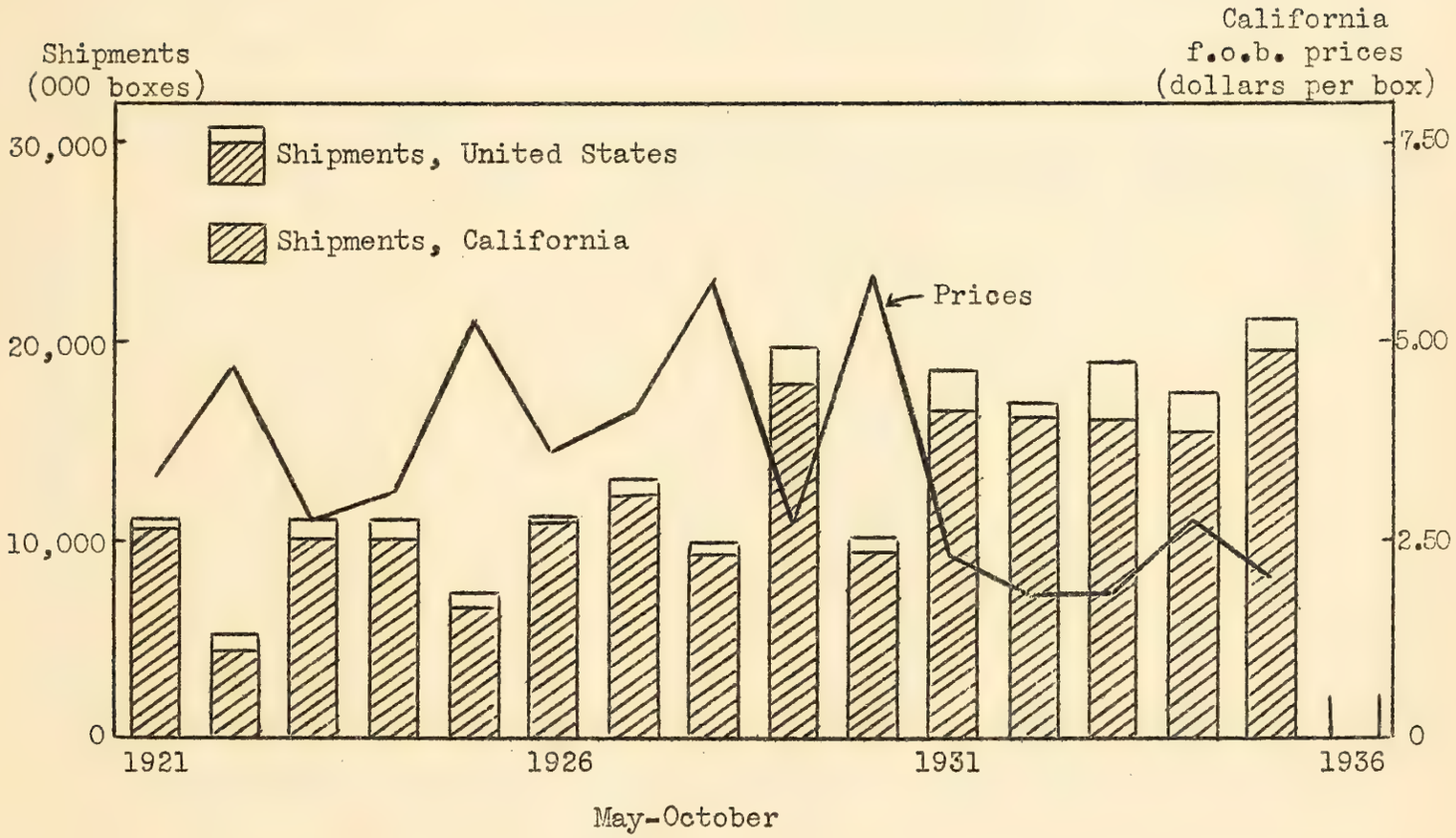


Fig. 2. Shipments of summer oranges in the United States and average prices of California summer oranges, 1921-1935. (Data from table 2.)

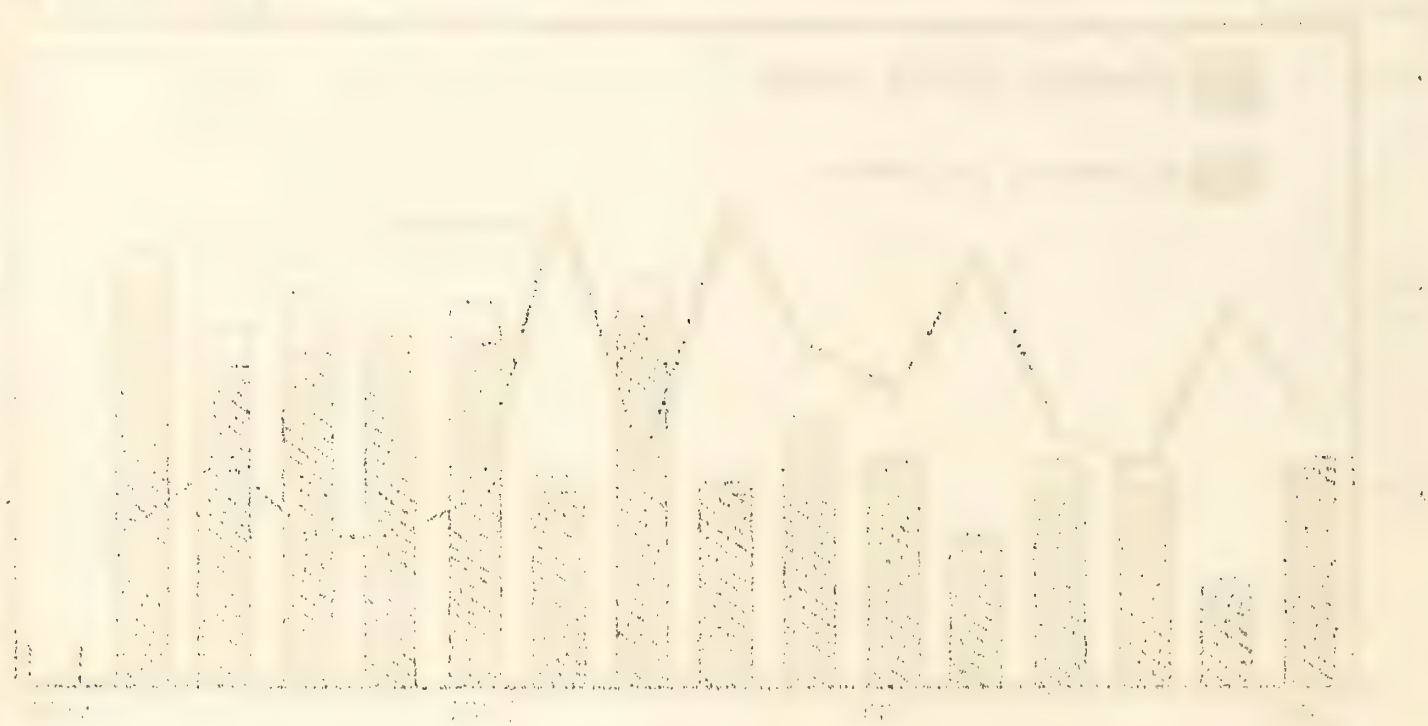


TABLE 3

Shipments of Winter Oranges in the United States, by States,
and Average Prices of California Winter Oranges
1920-21 to 1934-35

November to April	Shipments				California prices		
	California	Florida	Other states	United States	F.o.b. price	Price at packing house*	Price on trees†
	1	2	3	4	5	6	7
	thousand boxes	thousand boxes	thousand boxes	thousand boxes	dollars per box	dollars per box	dollars per box
1920-21	11,388	7,103	51	18,542	2.44		
1921-22	8,252	5,519	79	13,850	3.99		
1922-23	9,934	7,838	194	17,966	2.71		
1923-24	11,369	11,337	263	22,969	2.12		
1924-25	10,267	9,555	23	19,845	3.60		
1925-26	11,782	7,643	161	19,586	3.50		
1926-27	13,782	8,833	100	22,715	3.45		
1927-28	11,903	6,888	192	18,983	4.39		
1928-29	15,472	12,321	168	27,961	2.80		
1929-30	11,351	8,366	340	20,057	4.45		
1930-31	15,526	13,806	181	29,513	2.17		
1931-32	15,125	11,683	244	27,052	1.80	1.15	1.00
1932-33	13,132	11,008	277	24,417	1.43	0.87	0.74
1933-34	12,570	15,059	450	28,079	1.65	1.05	0.92
1934-35	17,050	13,004	585	30,639	1.80	1.20‡	1.07‡

* F.o.b. price less packing, selling, and advertising costs.

† F.o.b. price less picking, hauling, packing, selling, and advertising costs.

‡ Preliminary.

Sources of data:

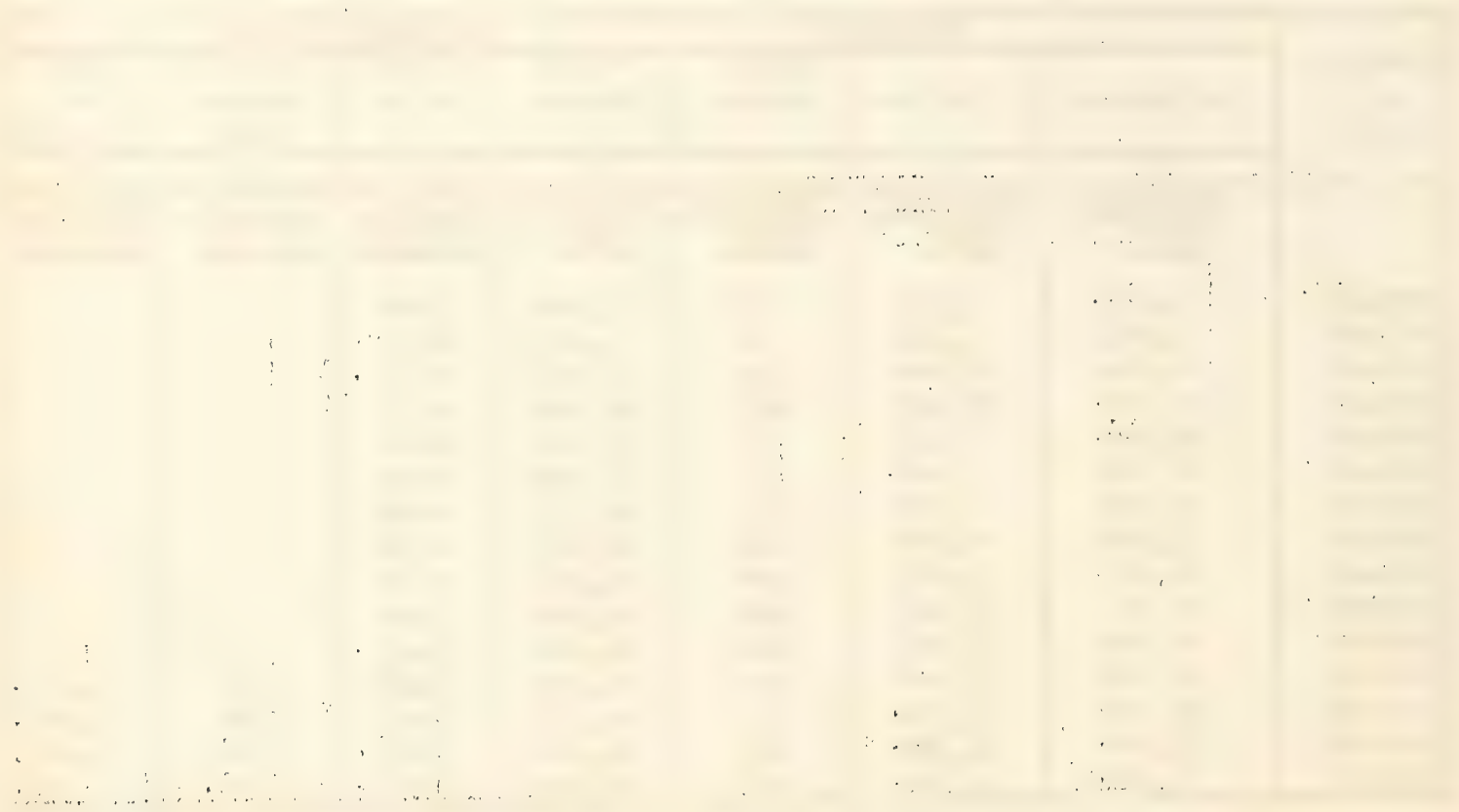
Col. 1: Compiled from records of the California Fruit Growers' Exchange.

Cols. 2 and 3: U. S. Dept. Agr. Annual summaries of carlot shipments (mimeo.) and Crops and Markets (monthly). Data converted from carlots to boxes.

Col. 4: Col. 1 plus col. 2 plus col. 3.

Col. 5: Compiled from records of the California Fruit Growers' Exchange. Prices are the weighted average prices received for oranges shipped during the six months, November through April, and include prices of packed fruit and loose fruit on a packed-box basis.

Cols. 6 and 7: Computed from cost data published in the Annual Reports of the General Manager of the California Fruit Growers' Exchange. 1932: Report for the year ended October 31, 1932. p. 29. 1933: Report for the year ended October 31, 1934. p. 27. 1934 and 1935: Report for the year ended October 31, 1935. p. 29.



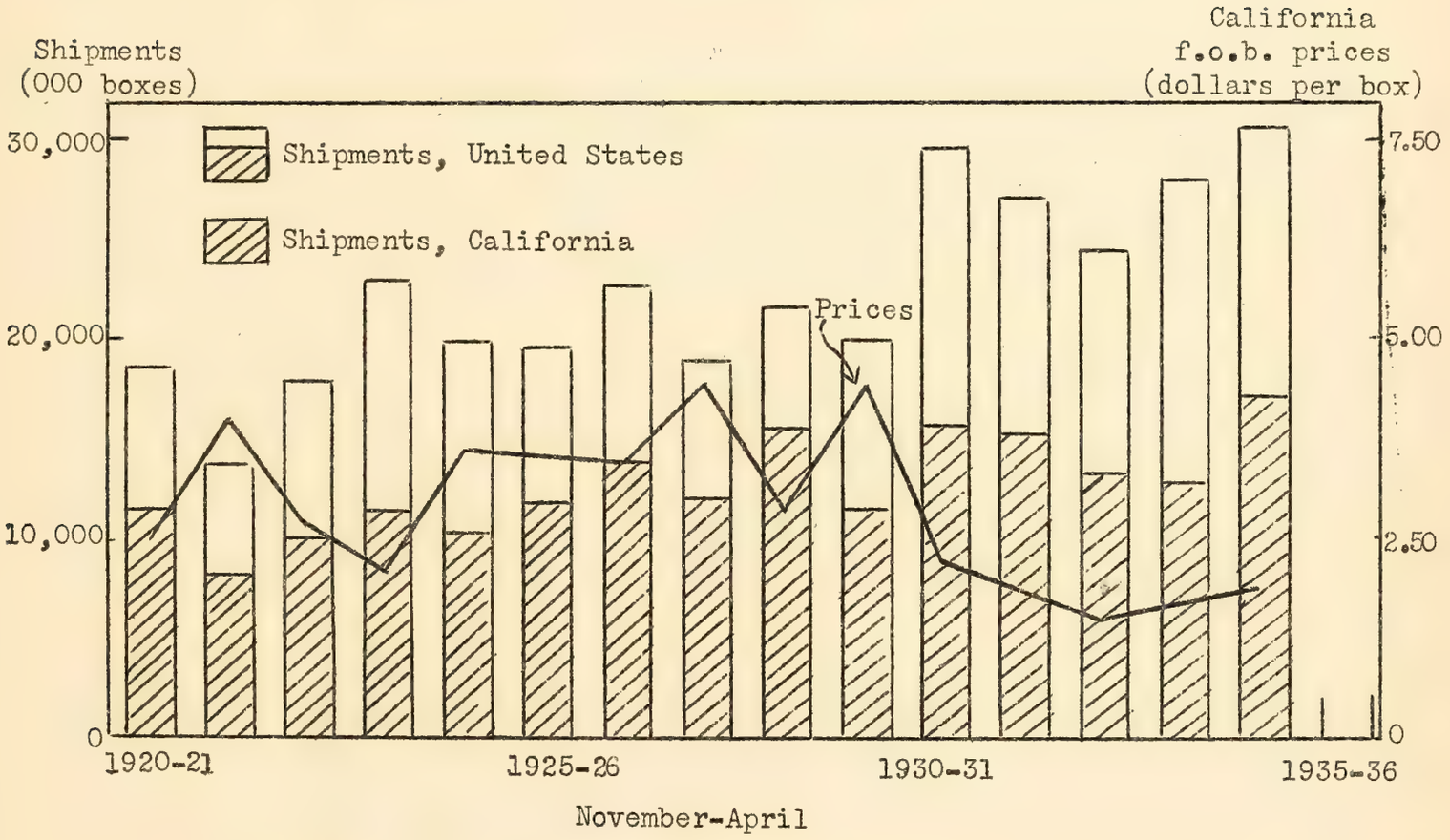
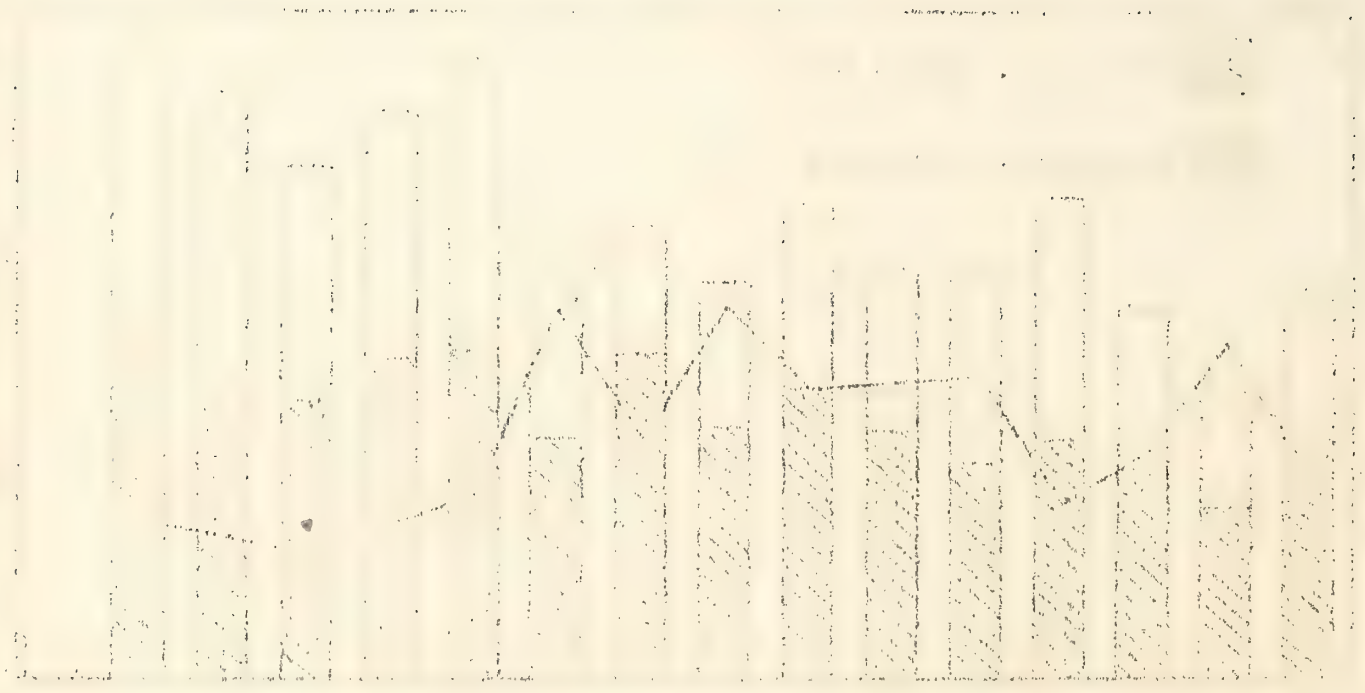


Fig. 3. Shipments of summer oranges in the United States and average prices of California winter oranges, 1920-21 to 1934-35. (Data from table 3.)



The Manufacture of Canned Orange Juice in California

Prior to 1931, as indicated in figures 2 and 3, the prices of both summer and winter oranges in California were maintained at levels sufficiently high as to permit the sale of all merchantable fruit as fresh packed fruit. Extensive advertising, together with the greater availability of the fruit in practically all markets at all times, had created a demand for the product which made it possible to sell increasing quantities of the fruit at the same or higher prices. The limited quantities of oranges which for one reason or another were unsalable as fresh fruit were converted into by-products such as oil of orange and pectin -- products definitely noncompetitive with fresh fruit -- at prices which were generally considered quite satisfactory.

Much of the growth in the demand for fresh oranges in the United States during the 1920's was at the expense of other fruits, notably apples and prunes. A large proportion of the fruit consumed by the American people is consumed at breakfast, and the old standbys of baked apples, applesauce, and prunes gave way to the preferred orange. The emphasis in advertising placed upon the health-giving properties of citrus fruits had considerable effect upon this shift, as did also the slogan, "Drink your oranges," which was designed to appeal to the many hurried breakfast-eaters of the nation.

Since 1931 the prices of both summer and winter oranges in California have been at very low levels. This has been due, in part, to the low buying power of consumers during these depression years and, in part, to the failure of the upward trend in the demand for oranges in the United States to keep pace with the ever-increasing supplies of the product which were available for sale. The favorable prices of the 1920's so stimulated the planting of oranges that the entire resultant excessive supplies have not been salable as fresh fruit at prices which would give satisfactory returns to growers.

In an attempt to make the best of the unsatisfactory condition of the market in recent years, the orange industry has put into effect various plans for controlling the volume of fruit to be marketed as fresh fruit. These plans have been predicated upon the theory that the total returns to growers for oranges increase as the volume sold decreases. Accordingly, large quantities of fruit have been withheld from the market for disposal in forms other than the fresh product.

As increasing quantities of oranges have been diverted from the fresh market to by-products channels, the profitableness of the latter means of disposal has also declined. The market outlets for many of the orange by-products, such as oil of orange, are quite limited, hence the offering of large supplies of the product on the market often proves very price-depressing.

The availability of large supplies of oranges at relatively low prices during the early 1930's gave an added stimulus to the development and use of many orange by-products. Among the more important of these products are concentrates, dairy orange juice, canned juice, pectin, and oil. Of these, only the first three are strictly "juice" products.

Orange concentrates include a wide variety of concentrated juices which manufacturers pack for use in carbonated beverages, ice cream products, and the like. They have been manufactured for many years from the low-grade oranges which were unsuitable for packing as fresh fruit. As the supplies of oranges at relatively low prices have increased, the output of orange concentrates has

increased along with that of other by-products.

"Dairy orange juice," as the trade has come to call it, is also an orange concentrate. It is referred to as a separate product in this report, however, because of its comparative newness, its rapid rise to popularity, and its unknown market limitations. The name of the product is derived from the fact that it is marketed through milk-distributing organizations -- another special characteristic of this particular orange concentrate. Although the exact make-up of the product varies with the concern manufacturing it, dairy orange juice is usually either a pure, concentrated orange juice or a concentrated orange juice blended, to standardize the color and flavor, with lemon juice and certified color. This concentrated product is shipped in large containers, usually gallon tins, to dairies all over the country, where it is combined with water at varying ratios, bottled, and either distributed house-to-house in conjunction with milk delivery or sold to soda fountains, restaurants, grocery stores, and similar places. A half-pint bottle of the produce retails at the standardized price of five cents. Manufacturers of dairy orange juice consider their product competitive with other five-cent beverages.

The results obtained in a survey of the manufacturers of orange by-products in California in February, 1936 indicate that nearly 36,000 tons of oranges were used in California in the manufacture of orange concentrates in 1935. Of this amount, about 12,600 tons, or 35 per cent, were used in the manufacture of the so-called "dairy orange juice." Assuming an output of 33.8 gallons of juice per ton of oranges, the average return obtained by the juice canners (see table 4), the pure-juice equivalent of orange concentrates manufactured in California in 1935 amounted to 3,016,800 gallons. The juice which went into dairy orange juice was about 1,055,880 gallons and that which went into other orange concentrates amounted to about 1,960,920 gallons.

For a number of years scientists have been working on the problem of perfecting some method for the preservation of pure citrus juices. Experiments have been carried on along both freezing and canning lines in an effort to develop a satisfactory method for preserving the product which would retain its natural flavor and at the same time would permit extensive distribution under conditions which are economically feasible. Many difficulties have been encountered in the process but none have as yet proven insurmountable. On the other hand, much progress has been made, some persons going so far as to contend that the problem has now been completely solved.

Data concerning the volume and cost of oranges used in the manufacture of canned orange juice, and the pack of the product, in California in 1935 are given in table 4. These values are based to a large extent upon the results obtained in the February, 1936 survey referred to above. Figures for earlier years are not given, because of the fact that the survey returns for those years were not considered sufficiently complete for that purpose. It is probably safe to say, however, that the volume of orange juice canned in California in 1934 did not exceed 40 per cent of the 1935 pack and that the packs of earlier years were of inconsequential commercial importance.

According to the figures given in table 4, 27,428 tons of oranges were purchased in California for the canning of pure orange juice in 1935. On the average, a price of $16.55 per ton was paid for this fruit. Thus the total value of the oranges used for this purpose amounted to $453,933. The quantity of orange juice obtained from a ton of oranges varied widely among the canners, the weighted average figure being 83.8 gallons. Accordingly, the total canned

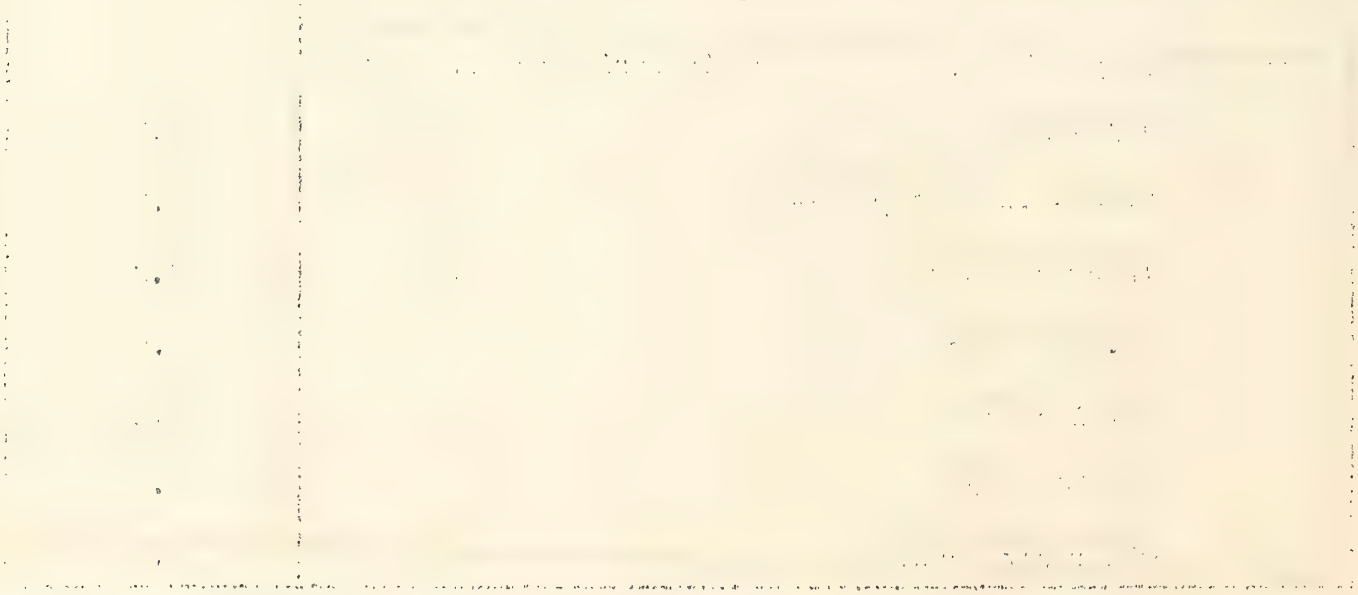
TABLE 4

The Volume and Cost of Oranges Used in the Manufacture of Canned Orange Juice, and the Pack of Canned Orange Juice, California, 1935

Item	Value
Tonnage of oranges used (tons)	27,428
Total cost of oranges used (dollars)	453,933
Cost of oranges used, per ton (dollars)	16.55
Total quantity of orange juice canned (gallons)	2,298,466
Quantity of orange juice canned per ton of oranges (gallons)	83.8
Cost of oranges used, per gallon of orange juice canned (cents)	19.8
Pack of canned orange juice (equivalent 24-can cases of No. 1 cans)	817,232
Percentage, by volume, of the pack in various size cans	
8 Z cans	0.7
Picnic -- No. 1 E cans	18.0
12-ounce cans	3.6
No. 300 cans	7.5
No. 1 cans	59.1
No. 10 cans	8.8
Other size cans	2.3

Source of data:

Estimates based upon the results obtained in a survey of the manufacturers of orange by-products in California in February, 1936 and upon data compiled by R. L. MacRae of the Growers' Advisory Committee, California-Arizona Citrus Marketing Agreement.



pack amounted to 2,298,466 gallons, or the equivalent of 817,232 cases of No. 1 cans at twenty-four cans per case.

A very large proportion of the orange juice canned in California in 1935 was put up in the No. 1 can, which contains 15 ounces (table 4). Nearly 60 per cent of the total volume of juice packed went into cans of this size. Another 18 per cent went into the so-called picnic or No. 1 eastern can which holds between 9 and 10 ounces and is often referred to as the 10-ounce can. Nearly 9 per cent was put up in the large No. 10 can, containing 3 quarts, for the use of large-scale consumers.

The Packs of Canned Fruit Juices Other than California Orange Juice

The success of the citrus industry in selling the American people the idea of consuming their fruit in liquid form has been a very important factor in the expansion of the market for all fruit juices. Moreover, the main competitors, from the consumers' standpoint, of oranges, a large proportion of which are consumed in juice form, have come to be tomato juice, grapefruit juice, and pineapple juice. As evidence of this fact, may it be noted that orange advertisements are no longer aimed at the baked apple and the stewed prune. They are directed at other fruit juices the output of which has, in recent years, become of sufficient importance to warrant a discussion in this report.

Canned Tomato Juice

Tomato juice and cocktail packs were first produced by several companies in the United States in the middle 1920's as a means of utilizing the waste products from tomato canning operations. However, as canners became more and more interested in the new product and the use of waste material proved less satisfactory than was anticipated, increasing proportions of it have been made from the whole fruit.

The federal biennial Census of Manufactures reports that in 1929 manufacturers throughout the United States produced 185,000 cases of canned tomato juice (table 5). The beverage spurted to popularity in 1930, in company with other fruit juices, and the production in that year amounted to a total of 1,338,964 cases. Since that time the annual output has continued to rise at a very rapid rate. The 1935 production has been estimated at 8,170,640 cases of cans of all sizes.

Tomato juice, unlike most other fruit juices of commercial importance, is canned in large quantities in widely separated parts of the United States (table 6). Of the estimated total 1935 pack of 8,170,640 cases, 13 per cent was canned in New York, 9 per cent in Maryland and Delaware, 26 per cent in Ohio and Indiana, 14 per cent in California, and 38 per cent in other states. This fact has a significant bearing upon the competitive position of canned tomato juice in relation to other canned fruit juices.

The distribution of the 1933, 1934, and 1935 packs of canned tomato juice in the United States, according to the size of container, is given in table 7. Although this distribution is not strictly comparable with that given for California orange juice, since the latter was based on volume rather than numbers of cases and the volume of cases of different sized cans varies, there is some indication that tomato juice put up for consumption in the home has usually been

TABLE 5

Canned Pack of Tomato Juice in the United States, 1929-1935

(Actual cases, of all sizes)

Year	Canned Pack
	cases
1929	185,000
1930	1,338,964
1931	3,476,244
1932	4,583,635
1933	4,170,794
1934	5,703,920
1935	8,170,640

Source of data: National Canners Association and U. S. Dept. Com. Biennial Census of Manufactures.

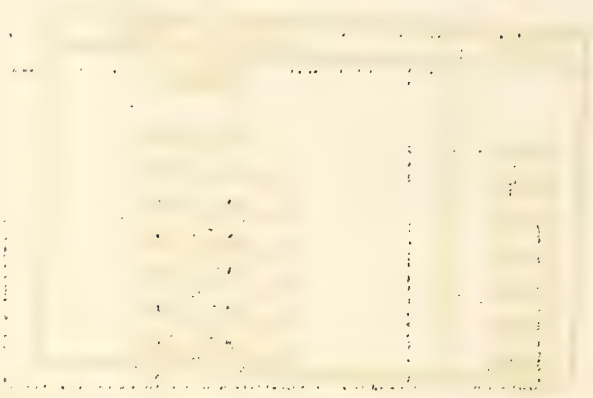
TABLE 6

Canned Pack of Tomato Juice in the United States, by States, 1933-1935
(Actual cases, of all sizes)

State	1933	1934	1935
	cases	cases	cases
New York	264,527	635,423	1,045,232
Maryland	*	300,407	351,083
Delaware	*	314,070	424,847
New Jersey and Pennsylvania	*	1,475,629	*
Ohio	207,027	51,470	120,490
Indiana	1,137,741	1,663,586	1,980,981
California	386,007	1,014,508	1,153,064
Other states	2,175,492	248,827	3,094,943
Total	4,170,794	5,703,920	8,170,640

* Included in "other states."

Source of data: National Canners Association.



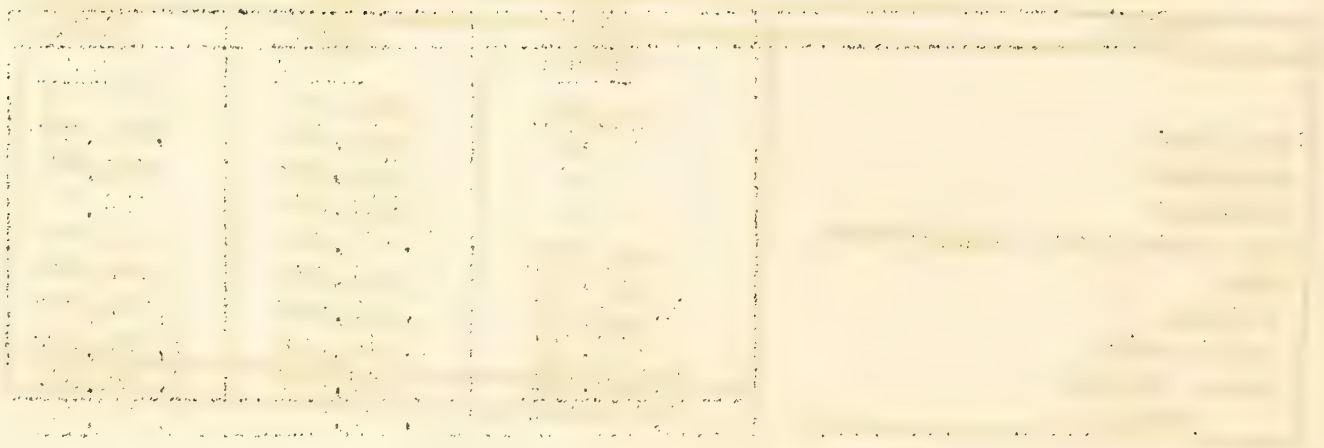


TABLE 7

Canned Pack of Tomato Juice in the United States,
by Size of Container, 1933-1935
(Actual cases)

Size of container	1933	1934	1935
	cases	cases	cases
No.1 E cans (cases of 48 cans)	566,991	1,609,120	2,329,994*
No. 300 and 303 cans (cases of 48 cans)	833,619	634,250	215,642†
No. 2 cans (cases of 24 cans)	209,783	762,441	799,191
No. 10 cans (cases of 6 cans)	550,230	862,751	1,174,012
Miscellaneous	1,576,912	1,400,102	2,683,929
Glass	433,259	435,256	967,872
GTotal	4,170,794	5,703,920	8,170,640

* Includes 211 x 400 and some 301 x 411.

† Cases of 36 cans.

Source of data: National Canners Association.

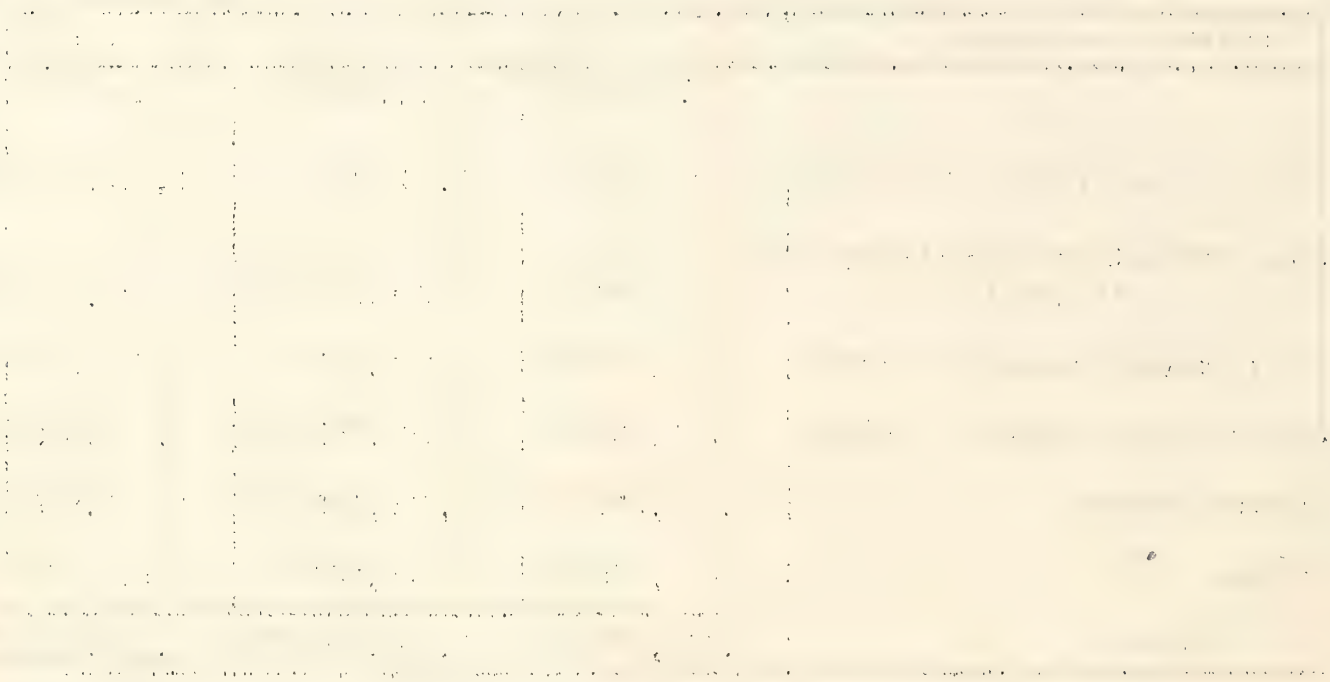
TABLE 8

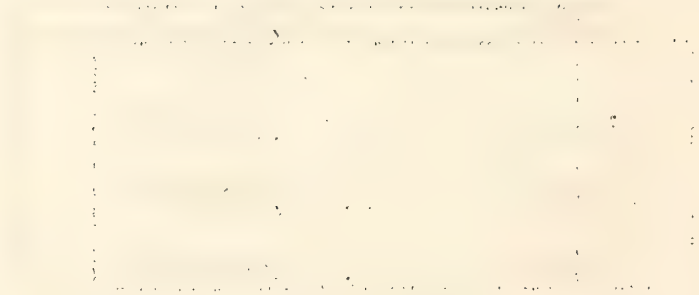
Canned Pack of Hawaiian Pineapple Juice, 1933-1935

(Actual cases of all sizes)

Year	Canned pack
	cases
1933	700,000
1934	2,000,000
1935	2,500,000

Source of data: Estimates given in Western Canner and Packer. Statistical Review Number. March 20, 1935. p. 92 and in Western Canner and Packer, March, 1936. p. 39.





canned in smaller-sized cans than has orange juice canned in California.

Canned Pineapple Juice

Pineapple juice has been canned for many years on a small scale. However, it was not until 1933, after an improved type had been developed, that the pack assumed sizable proportions. At first, the entire pack of the juice was produced from the waste materials of the canning operations where, in cutting out the central cylinders of the fruit, some of the sweetest and juiciest fruit next to the husk was lost. In recent years the pack has been so large that portions of the fruit not generally considered as waste materials have been required.

The estimated annual packs of canned pineapple juice in the Hawaiian Islands since 1933 are given in table 8. In two years the output has risen from 700,000 cases to 2,500,000 cases -- an increase of 257 per cent.

Florida Orange and Grapefruit Juices

The orange juice which is packed in Florida is so different from that canned in California as to warrant a distinction being made between the two juices. Inasmuch as the entire pack of the California juice is of the summer orange, primarily the Valencia variety, the product is very sweet in taste and a deep orange in color. The Florida product, on the other hand, is pale yellow in color and has a tartness in flavor similar to that of grapefruit. Some canned Florida juice has appeared on the market which is a combination of orange and grapefruit juices.

During the 1929-30 canning season, 37,552 cases of orange juice were packed in Florida (table 9). From 1929-30 to 1933-34 the output fluctuated between 36,362 and 61,110 cases. It has been estimated that the 1934-35 pack amounted to about 175,000 cases of 24 cans, No. 2 size -- a quantity over three times as great as the pack of the preceding year and 280 per cent greater than the average annual pack for the five years, 1929-30 through 1933-34.

The canned pack of grapefruit juice in Florida has been considerably larger than that of orange juice, averaging during the five years, 1929-30 through 1933-34, nearly ten times as large. In general, the growth of the Florida grapefruit juice canning industry has paralleled the growth in orange juice canning, at this higher level. The 1934-35 pack of Florida grapefruit juice has been estimated at 2,175,000 cases -- an amount over five times as large as the average for the preceding five years and over ten times as large as the estimated pack of Florida orange juice in the same year.

The distributions of the 1933-34 Florida packs of both orange juice and grapefruit juice, according to the size of container, are given in table 10. A very large proportion of the packs of both of these juices in that year was put up in the No. 2 can which contains 18 ounces.

Other Canned Fruit Juices

In addition to the large quantities of grapefruit juice canned in Florida in recent years, significant quantities are now being packed in Texas, Arizona, and California. No reliable statistical information on the size of the packs in these states is available.

TABLE 9

Canned Packs of Orange Juice and Grapefruit Juice in Florida
1929-30 to 1934-35

(Converted to represent cases of 24 cans, No. 2 size)

Year	Canned pack, orange juice	Canned pack, grapefruit juice
	cases	cases
1929-30	37,552	173,934
1930-31	61,110	412,066
1931-32	36,362	247,652
1932-33	37,258	727,803
1933-34	57,678	610,115
1934-35	175,000*	2,175,000*

* Subject to correction.

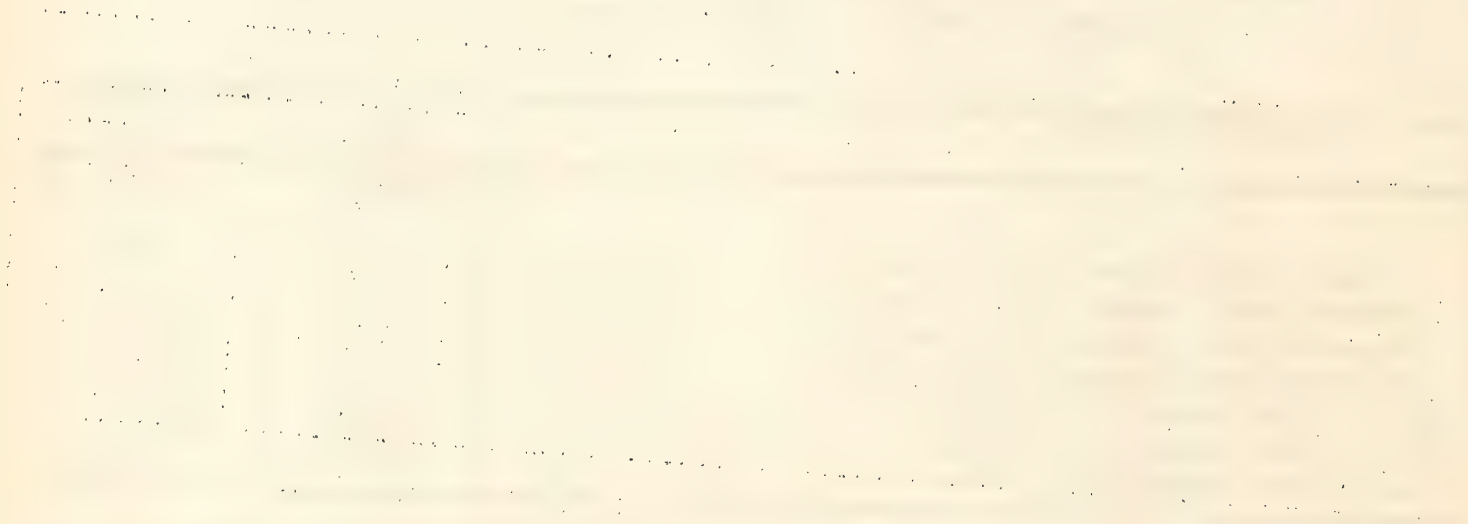
Source of data: Florida Citrus Exchange. Statistical Bulletin. Season 1934-35.

TABLE 10

Canned Packs of Orange Juice and Grapefruit Juice in Florida
by Size of Container, 1933-34 Season (actual cases)

Size of container	Orange juice	Grapefruit juice
	cases	cases
8-ounce cans (cases of 48 cans)	1,596	6,727
8-ounce cans (cases of 72 cans)	41	--
12-ounce cans (cases of 24 cans)	7,670	67,668
300 x 407 cans (cases of 36 cans)	--	23,741
No. 1 cans (cases of 48 cans)	13,269	57,010
No. 2 cans (cases of 24 cans)	33,848	394,659
No. 5 cans (cases of 12 cans)	2,182	56,012

Source of data: Florida Citrus Exchange. Statistical Bulletin. Season 1933-34.



Other canned fruit juices which have appeared on the market include prune juice, loganberry juice, lemon juice, and lime juice. Of these only prune juice and loganberry juice may be considered as competitive with orange juice, and the volume of these is so small that it is not much of a factor in the juice market. Both lemon juice and lime juice have special uses which put them in a class by themselves.

The Relation of Canned Orange Juice to Fresh Oranges and to Other Canned Fruit Juices

A large number of factors need to be taken into account in a discussion of the relation of canned orange juice to fresh oranges. From the consumer's point of view, there is the matter of "taste preference" for the product, of the relative cost of the juice obtained in the two ways, and of the comparative ease of obtaining, keeping, and using the two products. From the orange grower's standpoint, there is the all-important item of securing the largest possible net return for the product which he sells, considered from both the short- and the long-time points of view. Needless to say, the answer to the problem, looked at from the viewpoint of the grower, is, to a considerable extent, dependent upon the decisions which consumers make.

No evidence concerning the reaction of consumers in general toward canned orange juice is available at the present time. The results of the survey now being made in eastern markets by the Consumers' Counsel of the Agricultural Adjustment Administration are expected to shed much light on this particular aspect of the problem. In this report we shall have to omit a consideration of the influence of this factor, important as it is.

The relative cost, to the consumer, of orange juice obtained from a can and from the fresh fruit is, of course, dependent upon the price of canned orange juice, the price of fresh oranges, and the quantity of juice obtainable from fresh oranges, allowance being made for losses through spoilage. In table 11, some figures are given which indicate the quantities of orange juice which may be expected from a dozen oranges with various juice-yielding ratios. For example, at the rate of 85 gallons of juice per ton of fruit, a dozen oranges of size 228 will yield 20 ounces of juice. Similarly, a dozen oranges of size 300 will, with a juice-yielding ratio of 95 gallons per ton, give 17 ounces. At a price of 20 cents per dozen for oranges which will give 20 ounces of juice, the cost of juice is, of course, one cent per ounce or 15 cents for 15 ounces, the content of a No. 1 can of canned juice (table 12). If oranges are priced at 40 cents per dozen and that quantity of fruit will give 30 ounces of juice, the cost of the juice is 20 cents for 15 ounces.

The retail prices of oranges in Los Angeles, Chicago, and New York City, by two-week intervals, from August 15, 1933 to March 24, 1936, as compiled by the Bureau of Labor Statistics of the United States Department of Labor, are given in table 13. A graph of these prices appears in figure 4. The average retail price of oranges in Los Angeles during this period was 17 cents; in Chicago, 34 cents; and, in New York City, 37 cents.

Assuming, for the sake of illustration, that the oranges which retailed at the prices given in table 13 yielded 25 ounces of juice per dozen, the cost of 15 ounces of juice amounted, on the average, to 10.2 cents in Los Angeles, 20.4 cents in Chicago, and 22.2 cents in New York City. With a juice-yielding ratio of 20 ounces per dozen oranges, the cost of juice was 12.8 cents per 15

TABLE 11

Quantity of Orange Juice per Dozen Oranges with Various Quantities of Orange Juice per Ton of Oranges and Various Sizes of Oranges

Quantity of orange juice per ton of oranges	Size of oranges (number per 70-pound box)									
	108	132	156	180	204	228	252	276	300	324
gallons	ounces	ounces	ounces	ounces	ounces	ounces	ounces	ounces	ounces	ounces
60	29.9	24.4	20.7	17.9	15.8	14.1	12.8	11.7	10.8	10.0
65	32.4	26.5	22.4	19.4	17.1	15.3	13.9	12.7	11.6	10.8
70	34.8	28.5	24.1	20.9	18.4	16.5	14.9	13.6	12.5	11.6
75	37.3	30.5	25.8	22.4	19.8	17.7	16.0	14.6	13.4	12.4
80	39.8	32.6	27.6	23.9	21.1	18.9	17.1	15.6	14.3	13.3
85	42.3	34.6	29.3	25.4	22.4	20.0	18.1	16.6	15.2	14.1
90	44.8	36.7	31.0	26.9	23.7	21.2	19.2	17.5	16.1	14.9
95	47.3	38.7	32.7	28.4	25.0	22.4	20.3	18.5	17.0	15.8
100	49.8	40.7	34.5	29.9	26.4	23.6	21.3	19.5	17.9	16.6
105	52.3	42.8	36.2	31.4	27.7	24.8	22.4	20.5	18.8	17.4

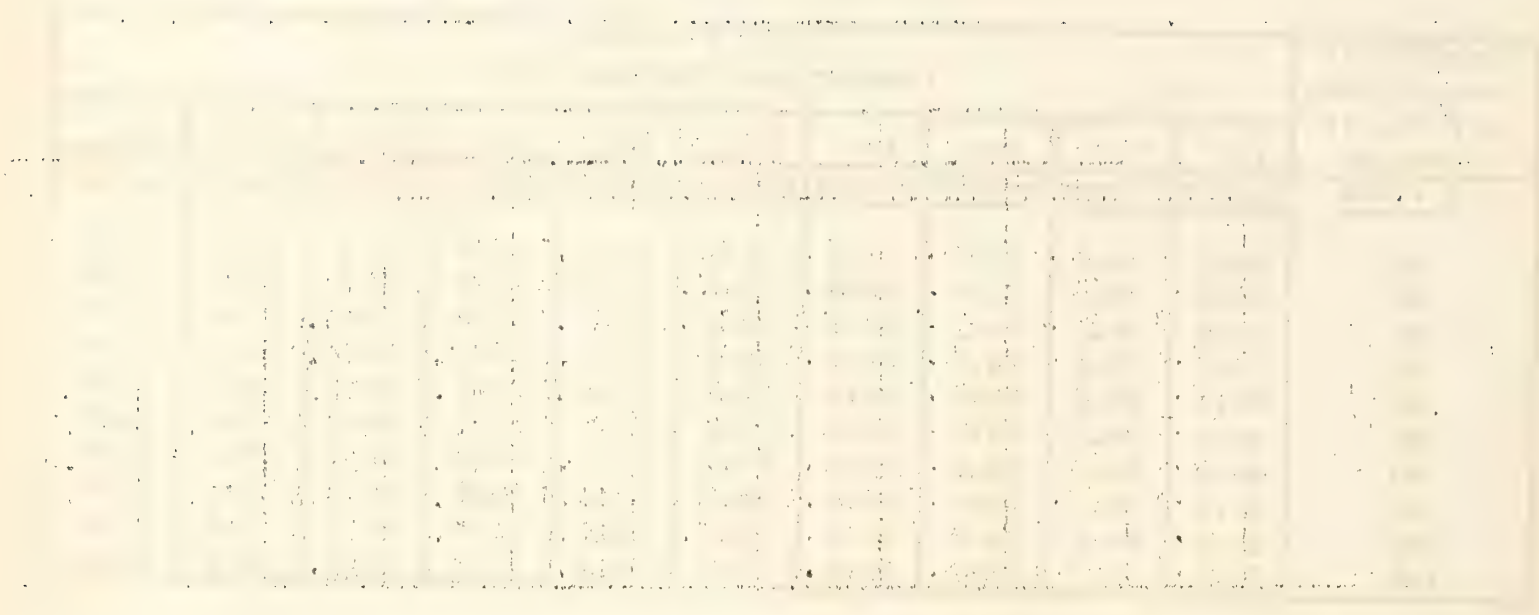
Source of data: Calculations by the author.

TABLE 12

Cost of Orange Juice per Fifteen Ounces with Various Quantities of Orange Juice per Dozen Oranges and Various Prices of Oranges

Quantity of orange juice per dozen oranges	Price of oranges (cents per dozen)									
	15	20	25	30	35	40	45	50	55	60
ounces	cents per 15 ounces									
10	22.5	30.0	37.5	45.0	52.5	60.0	67.5	75.0	82.5	90.0
15	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0
20	11.2	15.0	18.8	22.5	26.2	30.0	33.8	37.5	41.2	45.0
25	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0
30	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0
35	6.4	8.6	10.7	12.9	15.0	17.1	19.3	21.4	23.6	25.7
40	5.6	7.5	9.4	11.2	13.1	15.0	16.9	18.8	20.6	22.5
45	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0
50	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0
55	4.1	5.5	6.8	8.2	9.5	10.9	12.3	13.6	15.0	16.4

Source of data: Calculations by the author.



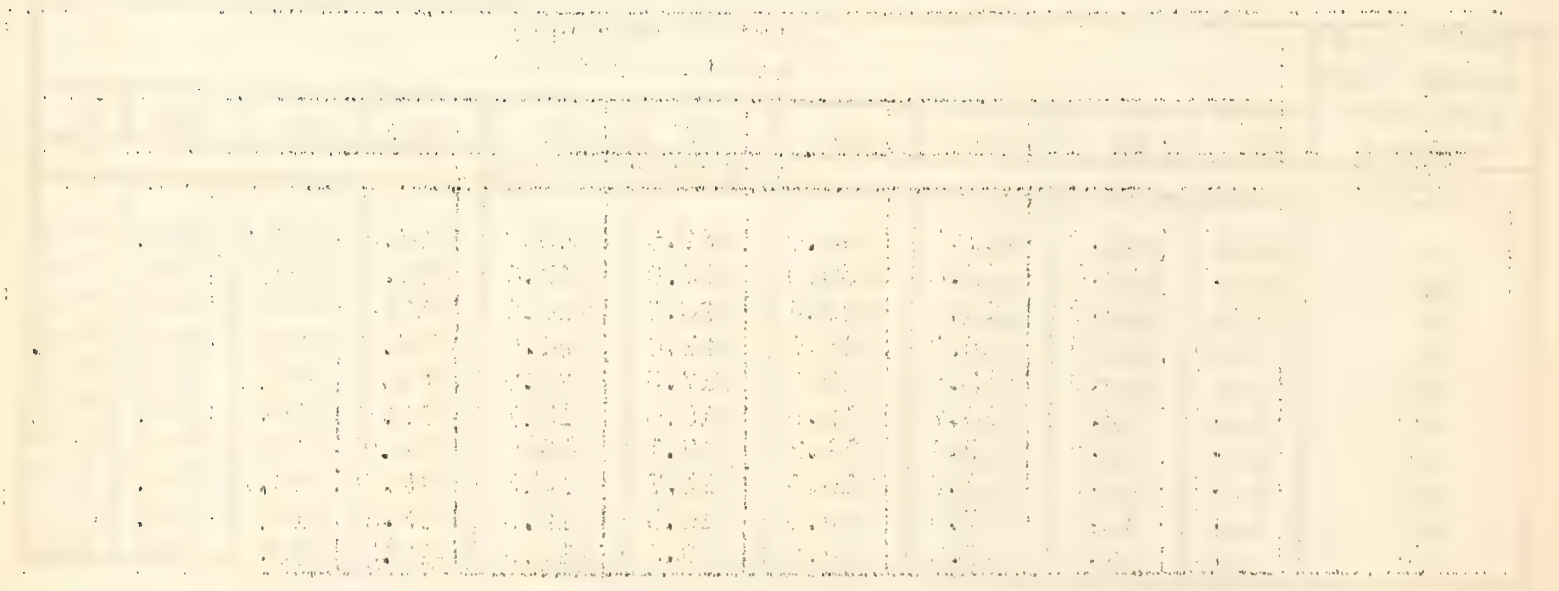


TABLE 13

Retail Prices of Oranges, Canned Tomato Juice, and Canned Peaches in Los Angeles, Chicago, and New York City, by Two-Week Intervals, August 15, 1933 to March 24, 1936

Date	Oranges			Canned tomato juice			Canned peaches		
	Los Angeles	Chicago	New York City	Los Angeles	Chicago	New York City	Los Angeles	Chicago	New York City
	cents per dozen			cents per 13½-ounce can			cents per no. 2½ can		
1933									
Aug. 15.	17.1	31.5	38.4	--	--	--	--	--	--
Aug. 29	17.5	28.7	35.8	--	--	--	14.1	18.4	15.0
Sept.12	17.7	29.1	36.5	--	--	--	13.7	18.6	15.3
Sept.26	19.6	32.2	37.2	--	--	--	14.2	18.8	16.0
Oct. 10	18.8	31.6	36.7	--	--	--	14.0	19.4	15.8
Oct. 24	17.6	32.5	35.6	--	--	--	14.1	18.9	16.1
Nov. 7	17.8	32.0	39.3	--	--	--	14.0	19.5	16.0
Nov. 21	18.3	30.4	34.8	--	--	--	14.0	18.6	15.8
Dec. 5	18.5	29.5	34.3	--	--	--	13.8	19.0	15.9
Dec. 19	17.2	28.7	33.7	--	--	--	14.0	18.8	15.9
1934									
Jan. 2	19.9	30.1	32.2	--	--	--	13.5	19.6	16.2
Jan. 16	18.5	31.3	31.3	--	--	--	14.7	19.3	16.3
Jan. 30	18.6	30.8	31.9	8.6	9.0	8.2	14.8	19.9	16.8
Feb. 13	18.5	29.4	31.8	8.0	9.3	8.4	15.0	19.6	16.4
Feb. 27	17.5	29.8	30.9	7.8	9.2	8.4	15.2	19.9	16.5
Mar. 13	17.5	30.2	30.4	8.0	9.3	8.2	15.0	19.9	16.6
Mar. 27	15.9	30.3	30.8	8.4	9.2	8.2	14.8	20.2	16.6
Apr. 10	15.8	31.0	30.2	8.5	9.2	8.9	15.0	20.5	16.4
Apr. 24	16.8	30.8	29.6	8.6	9.1	8.8	14.9	20.2	16.5
May 8	18.4	31.2	34.2	8.4	9.1	8.8	15.0	20.2	16.5
May 22	17.6	37.0	38.4	8.6	9.4	8.8	15.0	19.6	16.7
June 5	17.9	38.7	38.5	8.5	9.2	8.7	15.4	20.3	16.5
June 19	16.1	42.7	43.6	8.4	9.0	9.2	15.4	20.2	16.7
July 3	17.9	42.7	43.7	9.4	8.9	9.4	15.3	20.4	16.9
July 17	17.5	40.3	42.7	9.3	8.9	9.1	15.0	20.4	17.0
July 31	16.9	40.3	42.6	9.3	8.9	9.1	15.4	20.6	17.3
Aug. 14	15.4	37.9	44.3	9.3	8.8	9.2	15.4	20.9	17.3
Aug. 28	16.3	37.9	41.9	9.3	8.7	9.1	14.9	20.9	17.2
Sept.11	16.8	40.5	42.8	9.5	9.0	9.0	15.8	21.2	17.3
Sept.25	16.0	38.8	43.0	9.1	8.9	9.0	16.2	20.9	17.4
Oct. 9	16.6	37.0	40.6	9.0	9.0	8.9	15.9	21.4	17.4
Oct. 23	22.5	43.3	49.8	8.6	8.7	8.4	16.4	21.2	17.4
Nov. 6	21.4	40.6	42.5	8.6	8.7	8.5	15.7	21.7	17.5
Nov. 20	20.0	36.1	40.5	8.7	8.9	8.3	15.7	21.5	17.7
Dec. 4	18.5	32.7	36.3	8.6	8.8	8.2	15.8	21.6	17.6
Dec. 18	17.1	31.2	33.5	8.5	8.6	8.4	16.1	21.3	17.5

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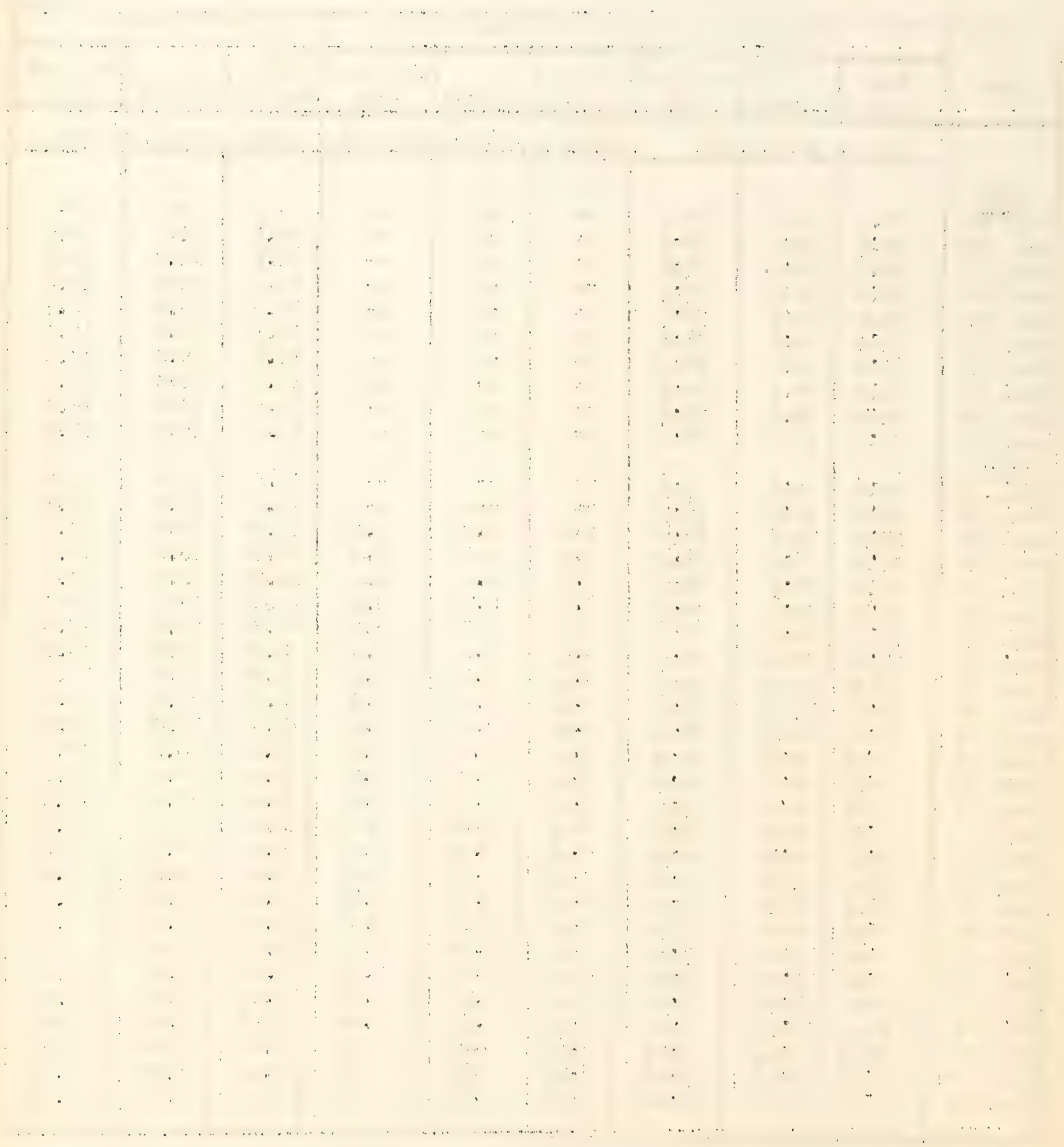
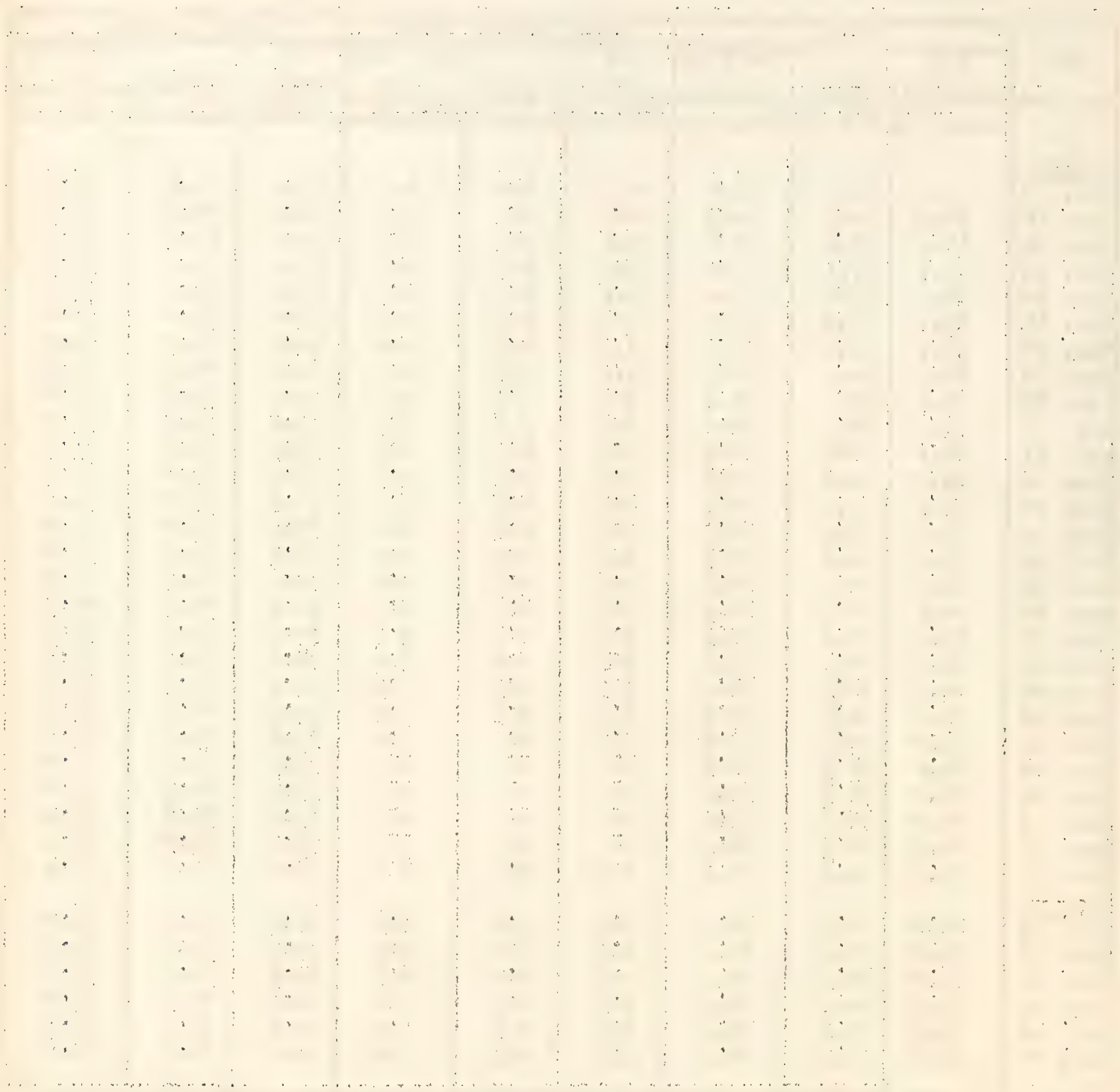


Date	Oranges			Canned tomato juice			Canned peaches		
	Los Angeles	Chicago	New York City	Los Angeles	Chicago	New York City	Los Angeles	Chicago	New York City
	cents per dozen			cents per 13½-ounce can			cents per no. 2½ can		
1935									
Jan. 2	16.8	30.9	35.5	8.4	8.6	8.4	15.9	21.5	17.6
Jan. 15	16.0	30.8	34.8	8.4	8.6	8.4	16.3	21.8	17.6
Jan. 29	17.0	32.8	27.0	8.5	8.6	8.4	16.3	21.6	17.7
Feb. 12	19.7	31.1	34.2	8.6	8.6	8.2	16.3	21.6	17.6
Feb. 26	18.0	31.7	35.4	8.3	8.5	8.3	16.6	21.8	17.7
Mar. 12	18.6	30.9	34.4	8.4	8.9	8.2	16.6	21.8	17.9
Mar. 26	18.2	31.8	34.3	8.3	8.6	8.3	16.7	22.2	17.8
Apr. 9	19.8	35.4	36.5	8.5	8.8	8.3	16.6	22.2	17.8
Apr. 23	20.4	35.7	38.0	8.4	8.7	8.3	16.4	21.8	17.8
May 7	23.0	35.7	37.4	8.4	8.8	8.2	16.3	21.8	17.9
May 21	25.9	35.6	36.3	8.4	8.8	8.2	16.0	22.3	17.8
June 4	18.2	32.9	39.3	8.4	8.8	8.2	17.2	21.7	17.6
June 18	17.2	32.2	38.0	8.5	8.8	8.2	17.2	21.9	17.7
July 2	21.2	31.3	35.1	8.5	8.8	8.1	17.1	21.8	17.7
July 16	15.0	32.9	36.5	8.4	8.8	8.3	16.3	21.6	17.8
July 30	14.6	34.3	39.2	8.5	8.7	8.3	16.3	21.5	17.9
Aug. 13	14.7	33.5	35.8	8.6	8.6	8.3	16.1	21.6	18.0
Aug. 27	13.7	32.8	36.9	8.4	8.3	8.2	16.2	22.0	18.1
Sept.10	14.3	37.3	41.2	8.5	8.9	8.0	16.4	22.9	18.0
Sept.24	14.1	35.5	43.6	8.1	8.9	7.9	16.4	22.7	17.7
Oct. 8	15.3	35.7	38.9	8.2	8.7	8.2	16.0	22.7	17.7
Oct. 22	13.9	36.3	41.6	8.2	8.7	8.2	16.2	22.5	17.6
Nov. 5	13.5	35.3	40.8	--	--	--	15.7	22.4	17.6
Nov. 19	14.0	35.9	39.0	--	--	--	15.5	21.5	17.3
Dec. 3	15.9	36.0	37.8	--	--	--	15.6	21.9	17.4
Dec. 17	14.4	36.0	37.6	--	--	--	15.3	21.9	17.4
Dec. 31	17.1	34.0	35.1	8.4	8.4	8.0	15.5	22.1	17.4
1936									
Jan. 14	16.8	33.6	35.0	8.4	8.3	8.3	15.6	22.1	17.6
Jan. 28	16.1	34.0	35.5	8.3	8.3	8.2	14.9	22.0	16.9
Feb. 11	13.8	33.3	35.7	8.3	8.2	8.1	14.6	21.1	17.0
Feb. 25	13.9	34.0	36.4	8.2	8.2	8.1	14.7	20.7	16.9
Mar. 10	13.7	34.7	34.5	8.2	8.1	7.9	14.3	21.1	17.0
Mar. 24	12.5	33.1	33.6	8.2	8.1	8.0	14.2	21.1	16.7

Source of data: U. S. Dept. Labor. Bur. Labor Statis. Retail prices -- principal articles of food by cities.



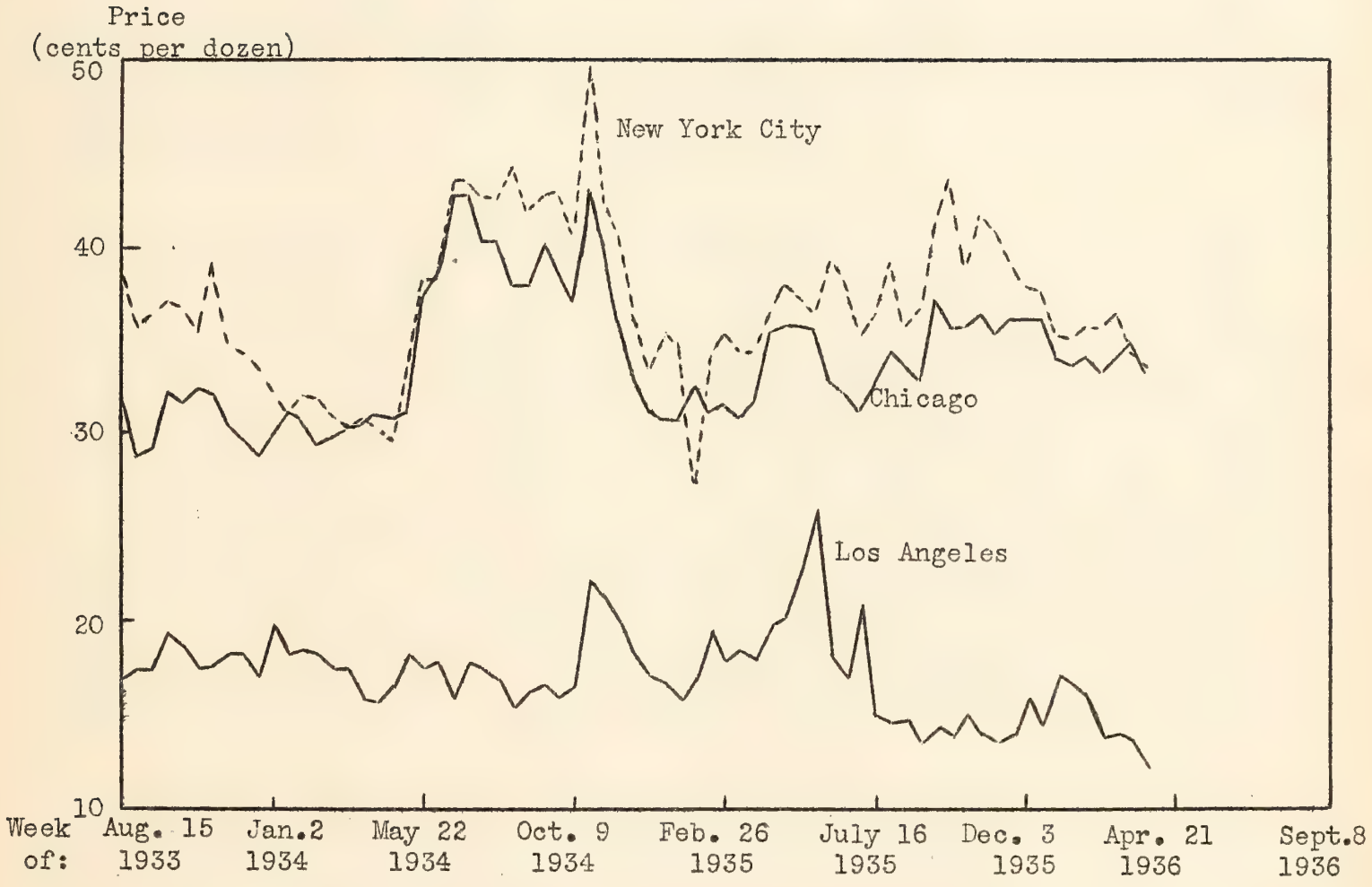
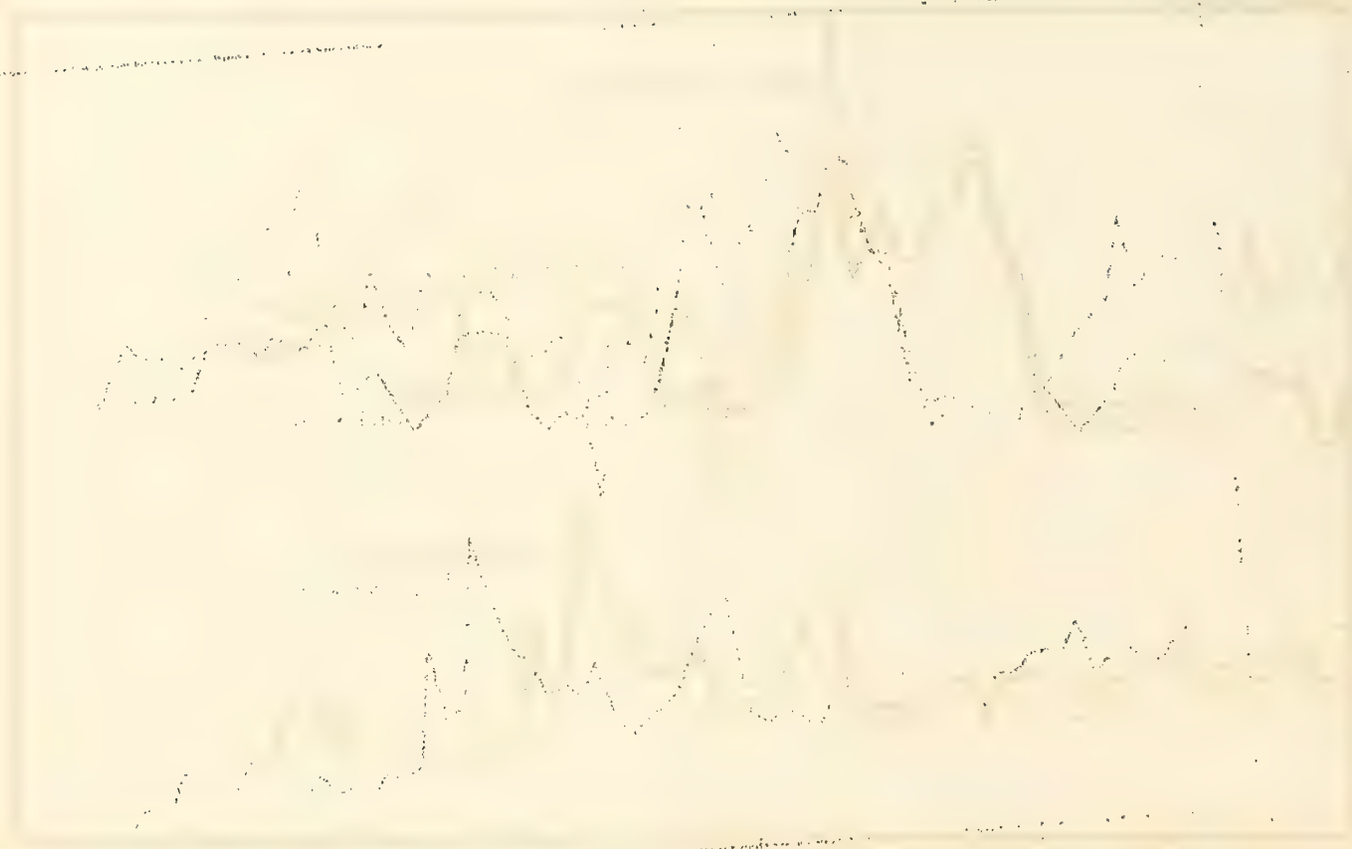


Fig. 4.-- Retail prices of oranges in Los Angeles, Chicago, and New York City, by two-week intervals, August 15, 1933 to March 24, 1936.



ounces in Los Angeles, 25.5 cents in Chicago, and 27.8 cents in New York.

The very wide differences in the prices which consumers pay in different parts of the country for juice reamed from fresh oranges are due, in part, to variations in distribution costs, such as transportation, and, in part, to variations in the quality of the product. Fruit shipped from California to New York City, for example, must bear heavy charges for freight and refrigeration, and in order to do this, it must be fruit of a high quality which will sell for a price sufficiently high to at least cover these large fixed charges. Oranges sold in Los Angeles, on the other hand, do not need to be packed, do not have high transportation costs assessed against them, and consequently may be low-grade fruit which sells at a low price.

No information is available concerning the differences, geographically, in the retail prices of canned orange juice. Some basis for inferring what these differences might be is, however, provided by data relating to canned peaches. California canned orange juice and canned peaches are analogous in the sense that both are canned products packed entirely, practically speaking, in the state of California and hence have similar distribution costs. The retail prices of the No. 2½ can of canned peaches in Los Angeles, Chicago, and New York City, by two-week intervals, from August 29, 1933 to March 24, 1936, are given in table 13, and shown graphically in figure 5. During this period, the prices which consumers paid for canned peaches averaged 15.4 cents per can in Los Angeles, 21.0 cents in Chicago, and 17.1 cents in New York. The price difference between Los Angeles and Chicago was 5.6 cents per can (36 per cent of the Los Angeles price) and between Los Angeles and New York City, it was 1.7 cents per can (11 per cent of the Los Angeles price). In the case of fresh oranges the price difference between Los Angeles and Chicago was 17 cents per dozen (100 per cent of the Los Angeles price) and between Los Angeles and New York City, it was 20 cents per dozen (118 per cent of the Los Angeles price).

Assuming that the same absolute differences in retail prices between Los Angeles and Chicago and between Los Angeles and New York City would maintain for canned orange juice as existed for canned peaches, a No. 1 can which retails for 10 cents in Los Angeles might be expected to sell for 15.6 cents in Chicago and for 11.7 cents in New York. With the same percentage relationships maintaining for canned orange juice as for canned peaches, the can of orange juice retailing for 10 cents in Los Angeles would retail for 13.6 cents in Chicago and for 11.1 cents in New York.

If one dozen oranges yields 20 ounces of juice and this fruit sells for 17 cents in Los Angeles, 34 cents in Chicago, and 37 cents in New York, the cost of 15 ounces of the juice is, as stated before, 12.8 cents in Los Angeles, 25.5 cents in Chicago, and 27.8 cents in New York. If a 15-ounce can of juice should sell for 12.8 cents in Los Angeles, one would expect, inferring from the aforementioned analogy, that the price in Chicago would be somewhere between 17.4 and 18.4 cents per can; and in New York, between 14.2 and 14.5 cents. Thus, it may be seen that the relative cost to the consumer of orange juice secured from fresh oranges and from a can may be expected to vary considerably in different parts of the country.

The third factor which needs to be taken into account in a discussion of the relation of canned orange juice to fresh oranges, from the consumer's point of view, is the comparative ease of obtaining, keeping, and using the two products. While it is true that fresh oranges are now obtainable in nearly every grocery store in the United States throughout the year, there are times when, in

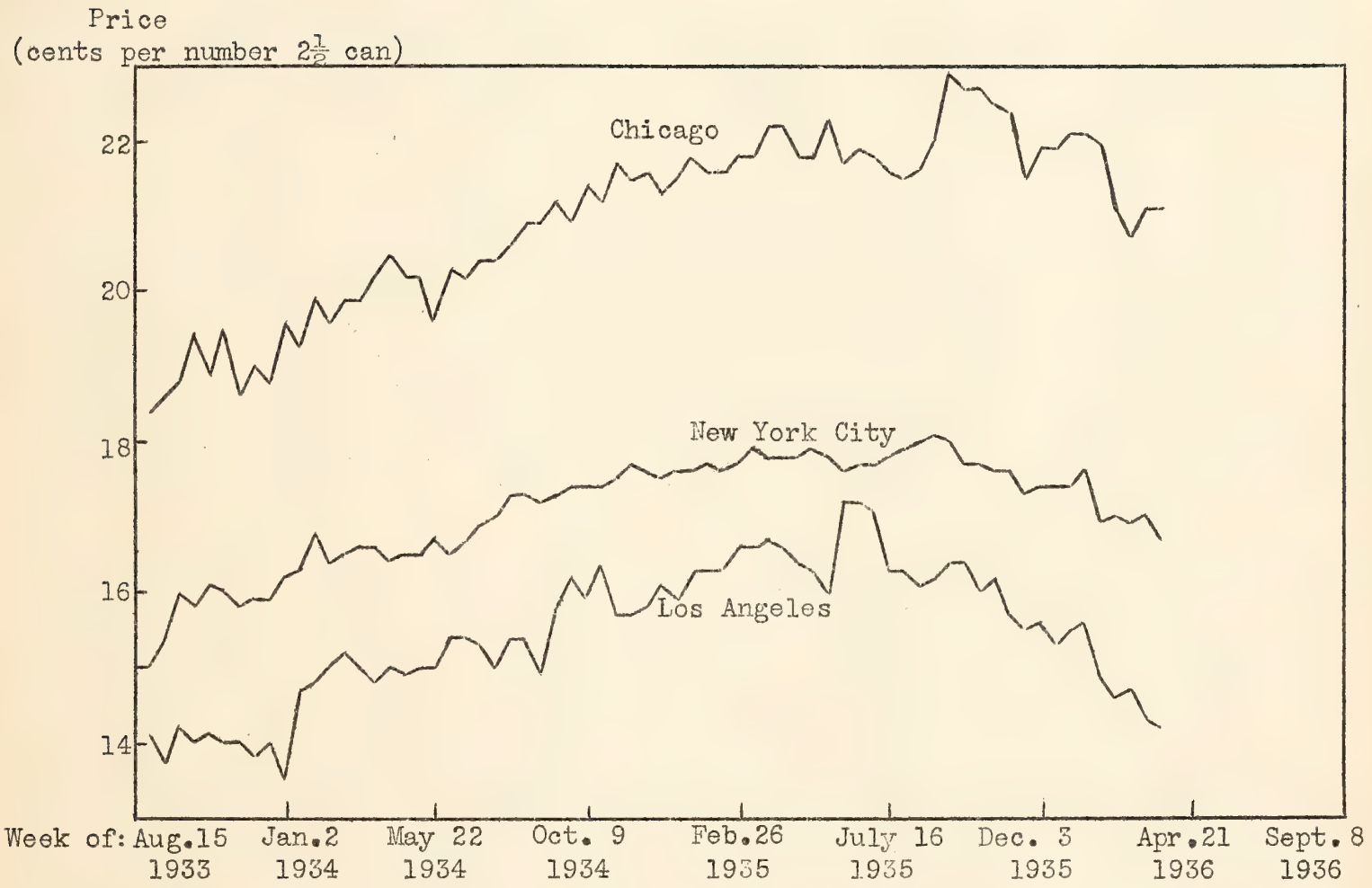


Fig. 5.-- Retail prices of canned peaches in Los Angeles, Chicago, and New York City by two-week intervals, August 29, 1933, to March 24, 1936.

many places, good quality oranges are unobtainable, except at prices which are so high as to greatly curtail consumption. The extent to which the quality of canned orange juice can be expected to approximate that of freshly extracted juice and to remain at a sufficiently high level is, as stated before, a matter for which there is no basis of discussion in this report. It may be expected, however, that the canned product can be made more readily obtainable than fresh fruit at prices which exhibit less seasonality. The comparative ease of using the product is a factor which operates in favor of canned juice. For most housewives, at least, opening a can is a much easier function to perform than reaming fresh oranges, whether this reaming is done by hand or by machine.

The relation of canned orange juice to other canned fruit juices should be brought out more fully in the report which the Consumers' Counsel of the Agricultural Adjustment Administration will make than can be given in this report. However, although no factual information is available concerning the competition which canned tomato juice, canned pineapple juice, and canned grapefruit juice offer oranges, it is inconceivable, in view of the rapidity with which the output of these products has increased, that they are not, in some degree, affecting the demand situation for the orange which is consumed, to a large extent, as a juice. Whether or not the availability of canned orange juice will in some measure counteract this influence is still another matter.

Some evidence of the competitive position, from a price standpoint, of canned tomato juice and fresh oranges can be obtained from the data given in table 13. As indicated above, the average retail prices of oranges in Los Angeles, Chicago, and New York City, during the period covered, were 17 cents, 34 cents, and 37 cents per dozen, respectively. Comparable prices for canned tomato juice were 8.5 cents per 13½ ounce can in Los Angeles, 8.8 cents in Chicago, and 8.4 cents in New York (see figure 6). No basis is provided for determining the absolute competitive relationship between oranges and canned tomato juice in any one of these cities, but it is evident from these figures that canned tomato juice is in a much more favorable situation, from the price standpoint, in Chicago and New York than in Los Angeles. If, in a consumer's mind, canned tomato juice at 8.5 cents per can is equivalent to oranges at 20 cents per dozen, his choice, under the conditions as stated, would be oranges in Los Angeles and tomato juice in either Chicago or New York. (This statement, as it stands, rather overstates the definiteness of consumers' decisions, but it illustrates the point which the author wishes to make.)

The relation of canned orange juice to fresh oranges and to other canned fruit juices, considered from the standpoint of its effect upon net returns to orange growers, involves many factors concerning which there is little basis for prognostication. Can one assume, if no orange juice is canned, that the net returns to growers for fresh oranges will, during either the next few years or the next decade, be in line with the net returns obtained in past years? Can one assume that the canning of orange juice will result in a changed demand for the product which will affect the net returns received by growers for the fruit? If so, in what direction may this force be expected to operate and what results may be anticipated?

During the 1935 season, canners of orange juice purchased 27,428 tons of summer oranges in California at a price of $16.55 per ton (table 4). At the same time growers received $1.41 per box for summer oranges delivered at the packing house door (table 2). This latter figure, converted to price per ton, amounts to $40.28. Some may be inclined to consider this discrepancy as an indicator of the relative prices which growers may expect to receive for fruit

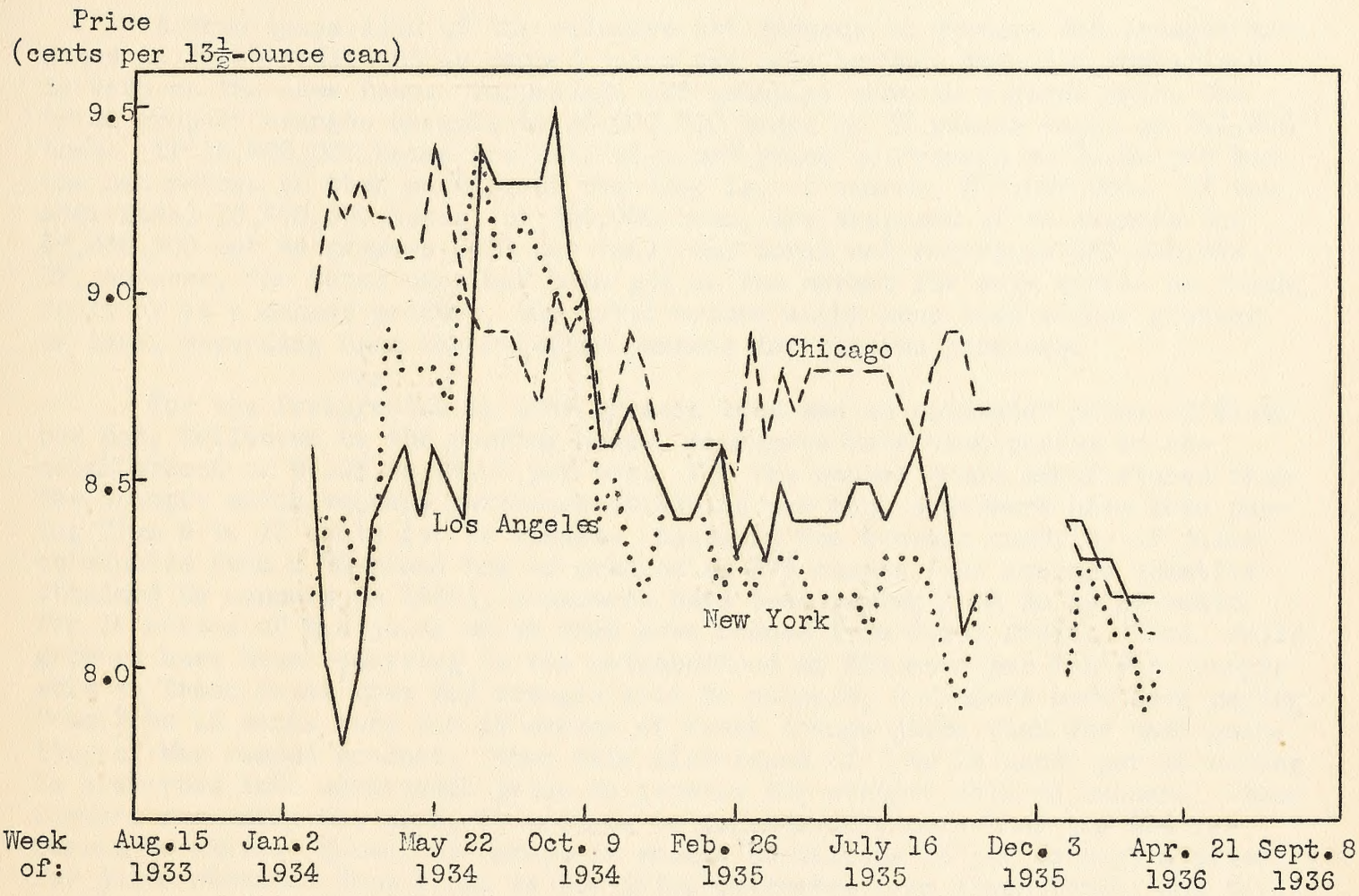
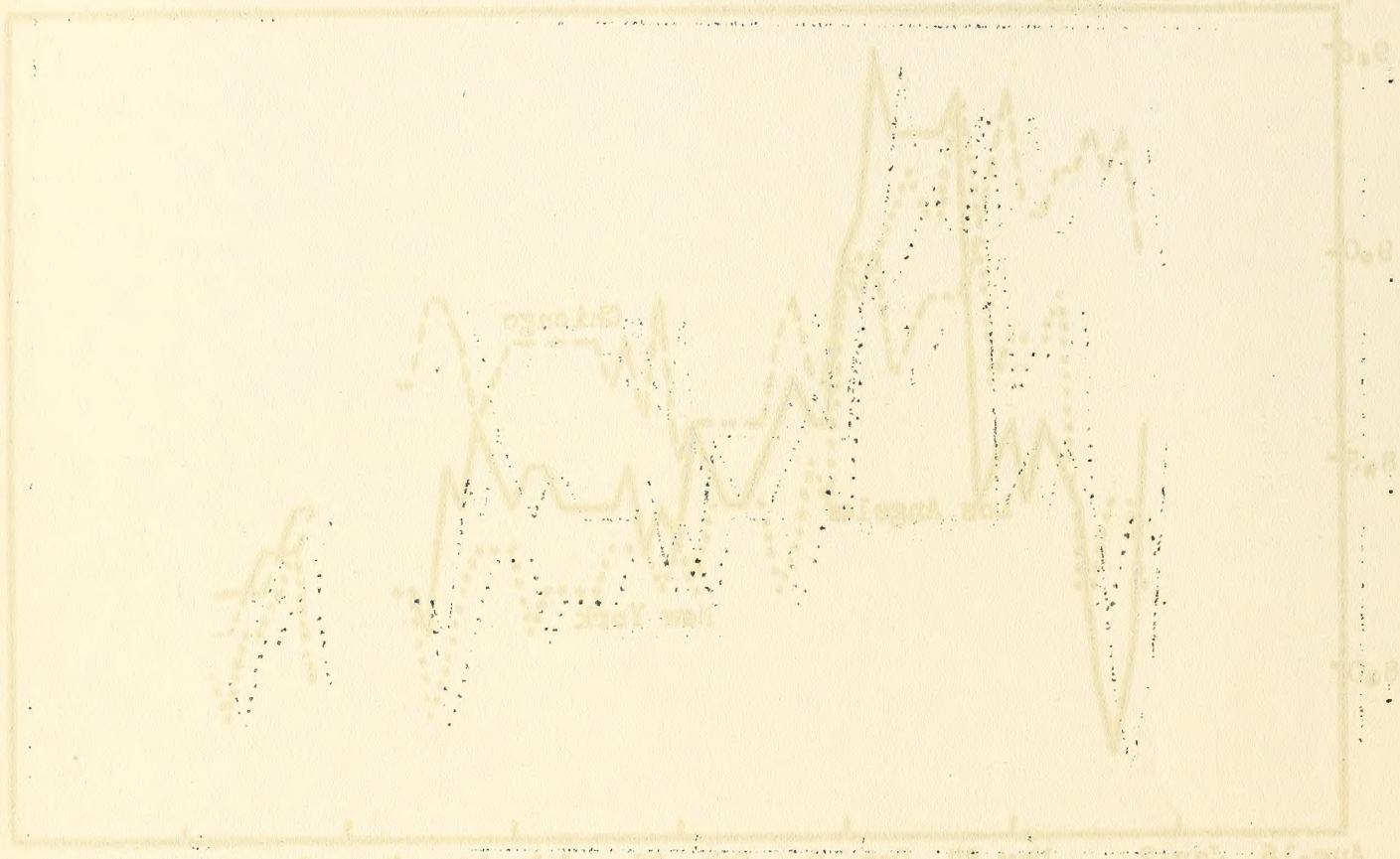


Fig. 6.-- Retail prices of canned tomato juice in Los Angeles, Chicago, and New York City, by two-week intervals, January 30, 1934 to March 24, 1936.



sold as fresh fruit and to canneries. There is a fallacy in such reasoning, however, inasmuch as the price received for the former fruit is somewhat higher than it otherwise would have been, due to the diversion of a large portion of the available supply to by-products channels, including that used in the manufacture of canned juice.

A true comparison of the relative net returns to growers for oranges marketed as fresh fruit and as canned juice can only be made when the comparison is made on the same base. Supposing, for example, that in a given year, the total crop of oranges amounts to 20,000,000 boxes of 70 pounds each, or 700,000 tons. If 10,000,000 boxes are sold at a net price to growers of $1.00 per box, the net return on that portion of the crop is, of course, $10,000,000. If the additional 10,000,000 boxes, or 350,000 tons, are disposed of to canners for $7,000,000 net to growers ($20 per ton), the total net return is $17,000,000. If, however, the total crop had been put on the market for sale either as fresh fruit or as a canned product, the total return might have been either greater or less, depending upon the relative demands for the two products.

for

For the fruit/which in 1935 growers received an estimated price of $1.41 per box, delivered to the packing house, consumers have been paying in the neighborhood of $5.00 to $6.00 per box. For the canned juice manufactured from the oranges which canners purchased at $16.55 per ton, consumers have been paying from 9 to 13 cents for 15 ounces. Assuming the average quantity of juice obtainable from a 70-pound box of oranges as 375 ounces (the average quantity obtained by canners in 1935), consumers have been paying from 20 to 24 cents for 15 ounces of the juice which they have reamed from fresh fruit. Thus, while growers have been receiving in the neighborhood of $24 more per ton for oranges sold as fresh fruit than for oranges sold to canners, consumers have been paying from 7 to 15 cents more for 15 ounces of fresh orange juice than for that quantity of the canned product. When this difference of 7 to 15 cents per 15 ounces is converted into additional price to growers for oranges sold to canners, other factors remaining the same, it amounts to considerably more than the $24 referred to above. Hence, if consumers should be willing to pay as high a price for juice obtained from a can as for juice extracted from fresh fruit, and to purchase as much of the product at that price as they would fresh oranges, it would appear from the foregoing that larger net returns to growers would result from selling oranges in cans. Thus after all is said and done, the relative profitableness to growers of marketing oranges as fresh fruit and as canned orange juice depends, to a considerable extent, upon the consumer.

Definite Conclusions Unwarranted

The author has carried the analysis of this problem as far as he feels the present available facts in the case have warranted. Canned orange juice is a new product for which the demand is an unknown quantity. Until the product has been on the market for some time, it is impossible to make very accurate estimates of the levels of prices at which given quantities can be sold. It is hoped, however, that the facts presented in this report will be of some help to those who must, of necessity, make decisions regarding the relationships involved and that the discussion will serve to clarify, at least in some small measure, the thinking on the problem. After the report on the consumer survey has been issued and as additional information concerning the problem becomes available, conclusions somewhat more definite than those presented herein may be warranted.